The Russian National Security Strategy : shaping perceptions and coordinating actions

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Russia's Arctic Army

Russia in Africa

The SU-57

Also:
TV Show Review &
Worldwide Equipment Guide (WEG)
Showcase and Updates

INSIDE THIS ISSUE

ON THE COVER: Arctic Ice Floe

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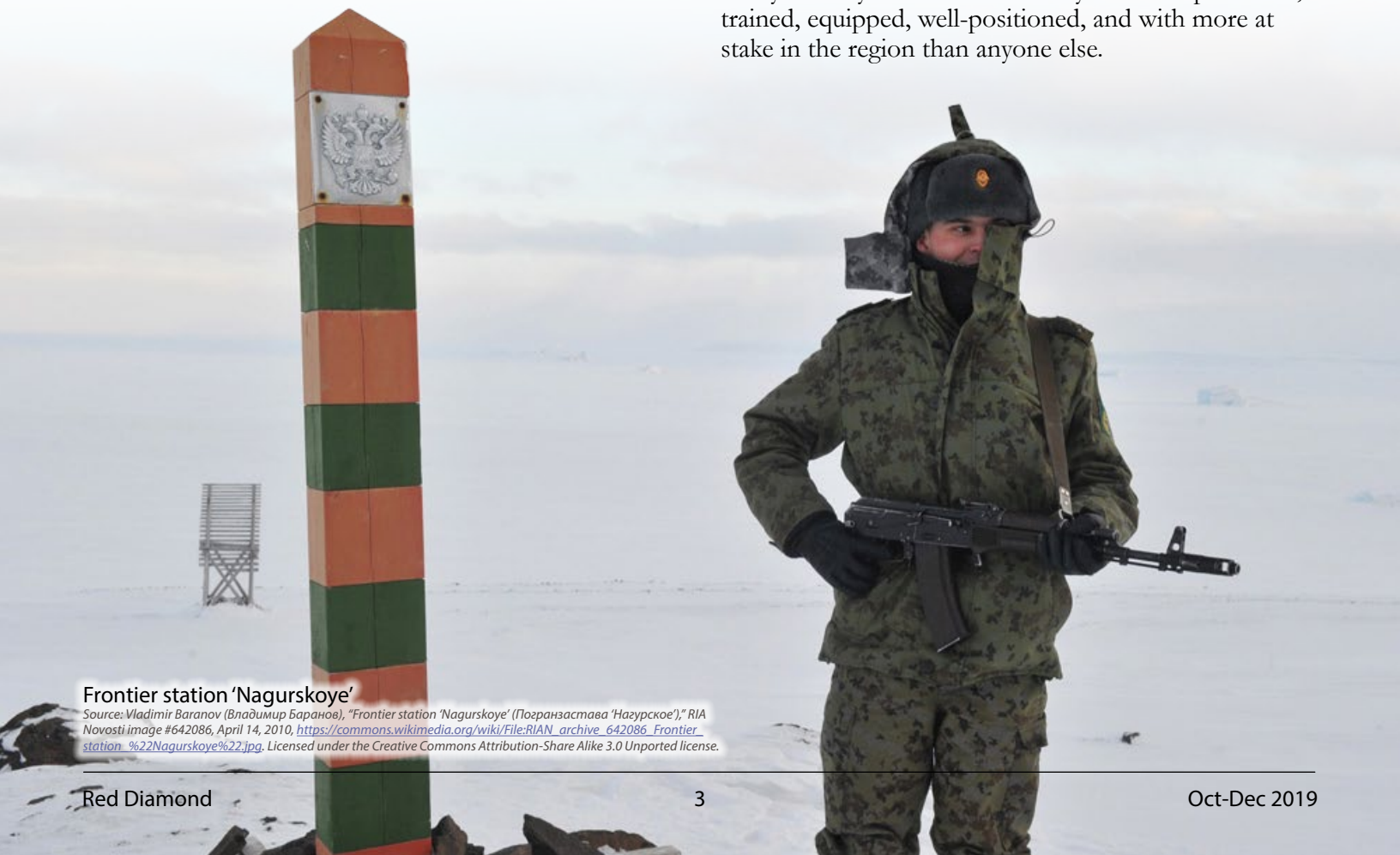
Russia's Arctic Army

By **Kevin Freese,** OE&TA; and **Marc Williams,** OE&TA

Introduction

In the hit superhero film *The Dark Knight Rises* (2012), the antagonist, Bane (Tom Hardy), addresses protagonist Batman (Christian Bale) espousing his advantage fighting in darkness "… *you think darkness is your ally? You merely adopted the dark. I was born in it, molded by it* …" In some ways, this quotation is analogous to Russian and US military approaches to the Arctic. Certain US units train periodically for Arctic operations but cold weather is a normal condition for the Russian military. Russian equipment is designed to operate in snow, ice, and swamp and at -50°C. Multiple formations are permanently stationed in the Arctic and other units train in the Arctic year-round. High-latitude rotations are routine, rather than exceptional.

Russia is the only US competitor with Arctic military forces. Russian Arctic military activity is one aspect of a long-term, global strategy,[1] but the Arctic is disproportionately emphasized compared to other regions[2] and Russia is always preparing for Arctic conflict.[3] Although the Arctic operational environment is one of the more stable regions of the world and conflict *over* the Arctic is unlikely, conflict *in* the Arctic remains a matter of concern. This article examines the Arctic operational environment, particularly as it relates to Russia, discusses Russia's strategic approach to the Arctic, highlights the Russian Army's Arctic-positioned forces, and provides a description of several key operating platforms the Russian Army uses in the Arctic. The US Army training community would be well-advised to take Russian Arctic capabilities seriously when designing and developing scenarios and scripts, in order to ensure the Army is ready to face an adversary who is experienced, trained, equipped, well-positioned, and with more at stake in the region than anyone else.



Frontier station 'Nagurskoye'

Source: Vladimir Baranov (Владимир Баранов), "Frontier station 'Nagurskoye' (Погранзастава 'Нагурское')," RIA Novosti image #642086, April 14, 2010, https://commons.wikimedia.org/wiki/File:RIAN_archive_642086_Frontier_station_%22Nagurskoye%22.jpg. Licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license.

The Arctic Operational Environment

The Arctic is one of the most extreme and dynamic environments in which an army could operate. It is dominated by seas covered in drifting ice.[4] Land topography is varied, ranging from glacier-covered mountains to shallow lakes and boggy peatlands.[5] Winters are long, dark, and cold; summers are short with continuous daylight.[6] Ionospheric storm impacts are pronounced[7] and geostationary satellites cannot provide coverage.[8] The Arctic population is small, dispersed, and isolated compared the rest of the world.[9] Much Arctic infrastructure, particularly in Russia, is built on permafrost in areas at risk for thawing in the near future.[10] Russian transportation networks are isolated from other European networks,[11] although development projects are underway to connect them.[12]

Climate change is increasing the importance of the historically small Arctic economy. Russia's Northern Sea Route (NSR) serves as a seasonal waterway between Asia and Europe and connects Russia's east and west; decreasing annual sea ice is extending its shipping season. Decreases in annual sea ice and advances in extraction technology also make Arctic natural resources more accessible. The Arctic has abundant, untapped mineral wealth, including precious metals, rare earths, and uranium, among others, as well as massive undiscovered fossil fuel resources.

Russia's Strategic Approach to the Arctic

Russia arguably has as many or more national interests based in the Arctic that any other country: The most Arctic territory, the longest Arctic coastline,[19] and the largest Arctic population of any country.[20] Russia economy depends upon hydrocarbon resources, much of which are in Russian Arctic territory. The NSR is a key shipping route for Russia, connecting its eastern and western extremes and allowing Russia to tap into global commerce. Much of Russia's strategic deterrent capability is based in the Arctic, particularly the Barents Sea and Kola Peninsula region.[21]

Arctic Boundary as defined by the Arctic Research and Policy Act (ARPA)

All United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering and Chukchi Seas; and the Aleutian chain.*

Acknowledgement: Funding for this map was provided by the National Science Foundation through the Arctic Research Mapping Application (armap.org) and Contract #0520837 to CH2M HILL for the Interagency Arctic Research Policy Committee (IARPC).
Map author: Allison Gaylord, Nuna Technologies. May 27, 2009.
*The Aleutian chain boundary is demarcated by the 'Contiguous zone' limit of 24-nautical miles.

US definition of the Arctic

Source: Allison Gaylord, "Arctic Boundary as Defined by the Arctic Research and Policy Act (ARPA)," US Arctic Research Commission, May 27, 2009, retrieved from: https://www.arctic.gov/maps.html. Public Domain.

The Arctic is prominent in Russian national policy, but is nested within global strategy. The 2016 *Foreign Policy Concept* states that Russian policy is "aimed at preserving peace, stability and constructive international cooperation in the Arctic," emphasizing international law can handle disputes. Russia maintains that states with Arctic territory have special rights and responsibilities for development and ties use of the NSR to that development.[22] The *National Security Strategy* of 2015 mentions the Arctic in the context of global exploitation of maritime fossil fuel resources, developing public-private relations in the security sector, and international development.[23] The *National Maritime Doctrine* identifies Russian Arctic policy drivers as ensuring Russian fleet access to the Atlantic and Pacific, natural resources in the economic exclusive zone and continental shelf, growing the NSR, and the Northern Fleets mission to defend Russia.[24]

Russia's actions towards the Arctic are consistent with these interests and strategy. Russia already has a polar ice breaker fleet that outnumbers the rest of the world's combined fleets[25] and is modernizing ports along the Arctic coast.[26] Russia has claimed authority to regulate ships transiting international waters in the NSR[27] despite international pushback.[28] Russia is improving space domain capability by expanding satellite coverage, with an additional twelve Earth-imaging satellites dedicated to Arctic surveillance planned to be in orbit during the next decade.[29] Moreover, Russian media continues to advance the narrative of Russian Arctic legacy and supremacy.[30] Simultaneously, Russia has been conducting scientific studies of the Arctic basin to legitimize claims before international bodies that the undersea Lomonosov ridge is connected to Russia's continental shelf.[31] If ultimately accepted by the international community, this would enable Russia to extend economic exclusivity to central Arctic natural resources.

The Russian military has three priorities in the Arctic: Maintaining strategic balance with west through nuclear forces, employing conventional power in the Barents region, and securing the NSR, particularly in the eastern littorals.[32] Russia's Arctic joint military capability is nested in the Arctic Operational Strategic Command, established at the Northern Fleet headquarters in Severomorsk in 2014.[33] The Russian Aerospace Forces

Expanded definition of the Arctic

Source: US Department of State, "Agreement on Enhancing International Arctic Scientific Cooperation Non-Binding Illustrative Map," US Arctic Research Commission, April 12, 2019, retrieved from: https://www.arctic.gov/maps.html. Public Domain

Arctic Shipping Routes

Source: CIA, "Arctic Shipping Routes" CIA World Factbook, 2019, retrieved from https://www.cia.gov/library/publications/resources/the-world-factbook/attachments/maps/XQ-map.gif. Image in public domain.

have an air defense division in Severomorsk[34] and were building an Arctic Air Squadron with fighter-bombers as of July 2019.[35] Naval forces include Russia's only aircraft carrier and nuclear cruiser, seven ballistic missile submarines, and dozens of submarine, naval aviation, and surface assets.[36] Ground forces include two Army Arctic brigades and a Naval Infantry brigade in addition to support formations.[37] Arctic military infrastructure includes 14 airfields, 5 coast guard stations, 9 military bases. Arctic forces deploy worldwide and non-Arctic forces deploy to the Arctic periodically.[38]

In addition to having military forces and a plethora of equipment and infrastructure positioned in the Arctic, Russia has been improving forces for Arctic operations through modernization and technological investment. Military improvements range from investment in bases to support long-range aircraft operations and coastal patrols,[39] upgraded air defense,[40] improving vehicle capabilities,[41] advancing drone and robotics technology for Arctic operations,[42] upgrading air and missile defense, and training forces extensively to operate in the region.[43]

Russian Arctic Ground Forces

Russian dedicated Arctic ground forces include the 80th Independent Motor Rifle Brigade in Alakurtti, the 200th Independent Motor Rifle Brigade in Murmansk, and the 61st Naval Infantry Brigade in Sputnik. These forces rotate on an 18-month basis to Franz Josef Land, using the Arctic Trefoil. The 80th resembles a standard Infantry brigade but with oversnow vehicles and training with dog sleds and reindeer sleds.[44] The 200th is equipped as a standard MRB with all-terrain vehicles for supply and logistics. They deployed to, Luhansk, Ukraine in 2014.[45] The 61st is based in Sputnik but has deployed to fight in the Donbass region and Syria.[46] In 2016, Russia announced it would be activating another Arctic Brigade in Chukotka, but gave no timeline.[47] Russia continues to innovate and refine vehicles for overcoming the Arctic environment.

Specialized Facilities

The Arctic Trefoil[48] (also known as the Arctic Shamrock) is a military facility built specifically to endure Arctic extremes. The 14,000 square meter facility is built on stilts. It houses 150 personnel on 18 month rotations and includes a medical clinic, library, chapel, gym, and cinema. Its purpose is to strengthen the Russian military presence along the NSR. There is also the Northern Clover base operating on Kotelny Island in the East-Siberian Sea.[49] More were being constructed along the NSR as of 2019.

Arctic-Specific Equipment

The Arctic environment stresses equipment through temperature extremes, high winds, and rough terrain. The Russians have adapted legacy platforms and developed new ones to deal with these climatic stressors. This includes air defense systems, logistics and resupply vehicles, combat vehicles, and aircraft. Many of the systems included here can be found in the Worldwide Equipment Guide (https://odin.tradoc.army.mil/WEG).

200th MRB Unit Patch and 61st Naval Infantry Brigade Patch

Source: VoidWanderer, "200 OMSBr VSRF," Wikimedia Commons, June 27, 2016, https://commons.wikimedia.org/wiki/File:200_OMSBr_VSRF.png; VoidWanderer, "61st Kirkenes Marine Brigade Patch," Wikimedia Commons, November 24, 2016, https://commons.wikimedia.org/wiki/File:61st_kirkenes_marine_brigade_patch.png. Both Public Domain.

Arctic Trefoil on Franz Josef Land

Source: "Video: Russia Establishes Arctic Shamrock Base on Franz Josef Land," Navy Recognition, August 29, 2018, http://www.navyrecognition.com/index.php/news/defence-news/2018/august-2018-navy-naval-defense-news/6468-video-russia-establishes-arctic-shamrock-base-on-franz-josef-land.html.

Tor-M2DT Air Defense System

The TOR-M2DT is a short-range (5-12 km) air defense missile system using the TOR-M2 missile launcher (NATO designation SA-15 "Gauntlet"). The system is adapted for the Arctic region by being mounted on the chassis of the DT-30PM articulated tracked vehicle. The TOR-M2DT was developed by the Russia`s JSC Izhevsk Electro-mechanical Plant Kupol (a subsidiary of the Almaz-Antey Concern).[50] The Tor-M2DT has been deployed in the Russian Arctic from Franz Josef Land to Chukotka.[51] The TOR-M2DT was revealed during the rehearsal for the Russian Victory Day Parade in April 2017.

YouTube Screenshots of Tor-M2DT in winter camouflage paint
Source: Defense Daily, "TOR M2DT Arctic Short Range Air Defense Missile System," YouTube, February 27, 2018, https://www.youtube.com/watch?v=iMDsjkzAvQM.

BTR-82 Armored Personnel Carrier (APC)

The BTR-82 armored personnel carrier is the latest addition to the BTR-80 family. It is an improved version of the BTR-80A/S, which entered service in 1994. It was developed largely as a complement (and a stop-gap) for a BTR-90, whose development has been long, troubled, and expensive. The BTR-82 is similar to the BTR-80A/S but has some minor improvements. In 2010, it successfully passed trials. Production commenced that same year. The original BTR-82 entered service with the Russian Army in 2011. However the original BTR-82 was not produced in large numbers because production soon switched to the up-gunned BTR-82A, which the Russian military uses in large numbers. Its operating temperature range is -50°C to +50°C (-58°F-+122°F). The 80th Independent MRB received the BTR-82A models in 2016.[52]

BTR-82A
Source: US Army Training and Doctrine Command, "BTR-82A Russian 8x8 Amphibious Armored Personnel Carrier (APC)," Worldwide Equipment Guide, https://odin.tradoc.army.mil/Search/WEG/BTR-82A.

Ruslan TTM-4902 PS-10 All Terrain Carrier

The Ruslan TTM-4902PS-10 carrier is a two-sectioned, tracked, amphibious all-terrain vehicle. It has a 300-horsepower engine and is capable of transporting up to 22 people as well as providing bed space for five. Manufactured by the CJCS Transport Company, the Ruslan was designed to transport cargo, repair teams, and equipment (up to 4000 kg) in off-road conditions. The first section is a power module (load-carrying capacity 500 kg). It is able to carry six people and has two full beds. The second section is a passenger module (16 people, six beds). The vehicle was tested in harsh conditions in the Murmansk region north of the Arctic Circle before entering into service. These vehicles are currently in use by Russian units in the Arctic. The Ruslan TTM-4902PS-10 has a temperature range of -50°C to +50°C (-58°F-+122°F).[53]

TTM-4902 PS-10 debarking from the Saint George Landing Ship
Source: Zarvan, "New TTM-4902PS-10 all-terrain vehicle tested during amphibious operation by Russian navy troops," Pakistan Defence, August 25, 2015, https://defence.pk/pdf/threads/new-ttm-4902ps-10-all-terrain-vehicle-tested-during-amphibious-operation-by-russian-navy-troops.393827/.

DT-10PM and DT-30PM "Vityaz" Articulated Tracked Vehicles

DT-10PM and DT-30PM

Source: US Army Training and Doctrine Command, " Vityaz DT-10PM Russian All Terrain Carrier, Worldwide Equipment Guide, https://odin.tradoc.army.mil/WEG/Asset/Vityaz_DT-10PM_Russian_All_Terrain_Carrier; US Army Training and Doctrine Command, "Vityaz DT-30PM Russian All Terrain Carrier," Worldwide Equipment Guide, https://odin.tradoc.army.mil/WEG/Asset/Vityaz_DT-30PM_Russian_All_Terrain_Carrier;

The function of the DT series of articulated tracked vehicle is to carry munitions, military equipment, and personnel through difficult terrain and weather conditions (-45°C to +40°C degrees). It has excellent off-road capabilities in any season, including swamps, virgin snow, unimproved dirt roads, and water obstacles throughout Russia's Siberia and Far East districts. These are two-unit transport vehicles with all four tracks driving. Because of low ground pressure, the vehicle is theoretically immune to certain types of at mines. ATVs are indispensable as recovery vehicles, since they have a high pull ratio and can approach a stuck or damaged vehicle from any direction in bad road conditions. The DT-30PM transporters are effective for search and rescue teams operating in extreme conditions (bad roads, floods, snow-drifts, land- and snow-slides, or large-scale destruction) when it is necessary to evacuate people, animals, and various cargoes or to transport rescue teams, medical personnel, equipment, and food to affected areas. The DT-30PM has a fully-enclosed forward-control cab, which provides seating for a driver and four passengers. The engine compartment is located behind the cab. The rear unit can accommodate a variety of bodies. In some variants, the rear unit can vary considerably from the front. It is fully amphibious. On water, it is propelled by its tracks. Owing to their unique design, the Vityaz-family ATVs are capable of operating in conditions impossible for other all-terrain vehicles,[54] for example:

- Amphibious return to a mother ship
- Off-road movement with one unit disabled or detached, or without both tracks on one of the units
- Negotiating ditches and clefts up to 4.0 meters wide
- Unloading of a ship offshore if it cannot come close to waterfront (i.e. in the Arctic and Antarctic regions, or in flooded regions, etc.); negotiating waterways in severe ice conditions
- Operating in mountains up to an altitude of 4,000 meters

TM-140 "Chetra" All-Terrain Vehicle

The TM-140 "Chetra" is manufactured by Chetra PM. It is a commercial Arctic vehicle created for oil workers and geologists working in difficult terrain and climatic conditions, adapted for military use. It functions well in snow and swamp environments. It can come equipped with a passenger module, a workshop module, or special purpose modules (pile driving, drilling rig, or crane).[55]

TM-140A amphibious, all-terrain, tracked, Arctic cargo/personnel carrier

Source: DefenseWebTV, "TM-140A Amphibious All Terrain Tracked Cargo Personnel Carrier Arctic Vehicle Russia Russian Army," YouTube, January 8, 2016, https://www.youtube.com/watch?v=W2WfxSwnhVQ.

Specifications			
Weight	11.2 tons	**Engine**	Yaroslavl 250hp turbo-diesel
Length	2,710 mm	**Engine pre-heater**	Yes
Width	2,650 m	**Armor**	Engine compartment only. Optional add-on armor for protection against small arms.
Height	2,190 mm		
Road Speed	45 km/h		
Swim speed	5 km/h	**Ground pressure**	0.26 kg / sq. cm
Fuel Capacity	830 liters	**Clearance**	450 mm
Carry capacity	4 tons	**Arctic equipment**	Dual-circuit heating system
Range	800 km unloaded	**Power**	24 volt
	550 km loaded	**Passenger module**	2.7 × 2.65 × 2.19 m
Temperature range	–50°C to +50°C	**Weapons**	Can be fitted with a remote weapon station armed with one machine gun
Incline	30 degrees		

Mi-8AMTSh-VA Arctic helicopter

The Mi-8AMTSh-VA is a variant of the Mi-8 HIP multi-role transport helicopter and was first fielded in 2015 to the Russian Air and Space Force (RuASF). The Russian Navy received its first version in 2016. Produced by the Ulan-Ude Aviation Plant (U-UAP) in southeastern Siberia, it has been modified for Arctic conditions. With an additional power unit, the helicopter can start up in temperatures down to -60°C and remain in the open air without a hangar for up to five hours in a ready for take-off state.[56] Designed as a transport helicopter, the Mi-8 proved a multi-purpose machine. The cable external suspension, equipped with the weight-measuring device, makes it possible to carry large size cargoes weighing up to three tons. If required, it can serve as either a combat, rescue, or artillery observation helicopter. The Mi-8AMTSh-VA is deployed to Kotelny Island, Tiksi, Nagurskaya, Anadyr, and Mys Schmidt.[57] It is used for resupply, reconnaissance, and search and rescue operations in the Northern Sea Route. Russia is expected to purchase 100 more models for use in the Army and Federal Security Service in Vorkuta.[58]

Mi-8 helicopter

Source: US Army Training and Doctrine Command, GTA 20-17-003 Worldwide Equipment Identification Cards Russia Edition, August 1, 2019, https://armypubs.army.mil/ProductMaps/PubForm/Details.aspx?PUB_ID=1007539

Specifications			
Arctic equipment	*Hydraulic, fuel and oil systems use Teflon hoses *Thermal insulation *MSK immersion suits over cold waters *Snow skis/slump pads *Alcohol anti-icing for the cockpit windows *Oven and hot water boiler for use by the aircrew and passengers *Increased battery capacity	**Engine**	2x Klimov VK-2500-03 turboshafts
		OEI Mode	2,700shp for 2.5 minutes
		Take-off mode	2,400shp for 30 minutes
		Cruising rate	1,500shp for 60 minutes
		Auxiliary power unit	Modified TA-14 provides preheating for engine, main gearbox, cabin, cockpit, engine bays and transmission
		Overhaul time	2,000 hours
		Service life	6,000 hours
		Payload/Range	2,900kg (4,409lb) / 540km (291nm)
		With two external tanks	1,500kg (3,306lb) / 980km (529nm)
Avionics suite	*PKV-8 Series 2 digital autopilot system *TsNS-02 digital navigation system *BINS-SP-1 inertial gyro reference platform *Kontur-10Ts weather radar	**With two cabin auxiliary fuel tanks**	800kg (1,763lb) / 1,420km (766nm)
		Weapons	PK 7.62mm machine gun. 1 rear, 2 sides.
		Mission equipment	*Prima-DMV and Prima-KV transceivers *RPA-500 direction finder *TSL-1600 searchlight *SLG-300 electrical rescue hoist rated at 660lb (300kg) * LPG-150M, rated at 331lb (150kg) *12 stretchers in MEDEVAC configuration with internal aux tanks removed *Droppable life rafts for SAR missions.
NVG flying	Geophizika-NV GEO-ONV-1-01 Gen III NVGs		
Protection	*6x UV-26M 32-round countermeasures dispensers		
	*Metal/ceramic armor protection for cockpit, cabin and all vital systems		

Fire Support Vehicle Toros

The Toros is an Arctic adapted vehicle developed by Muromteplovoz based on the MT-LBu chassis.[59] It is used for carrying personnel, transporting loads, infantry fire support, and escort and guard missions in Arctic conditions.[60] In addition to deep cold, this vehicle can operate in mountainous areas up to 3,000 meters above sea level, and up to 4,000 meters with some modifications.[61] Specifications include:

Specifications			
Combat weight	15 tons	**Engine**	YaMZ-238BL-1 (310 h.p.) diesel
Length	7,210 mm	**Combat turret**	MB-2
Width	3,150 mm	**Weapons**	*30mm 2A42 auto cannon *7.62 PKTM coax machinegun *30mm AGS-17 automatic grenade launcher *Six 81mm Tucha 902V smoke grenade launchers
Height	1.905 mm		
Road Speed	60 km/h		
Range	500 km		
Swim speed	4-6 km		
Optics	TKN-4GA-03 combined optical/ infrared sight with integrated thermal imager	**Optional weapons**	M113M Konkurs-M anti-tank guided missiles (ATGM)
		Armor	Level 3 (K) STANAG 4569
Towing capacity	6.5 tons	**Arctic equipment**	*Adjustable plow blade *VSN-9DN generator *Additional insulation * Polar 4D-24 air heaters
Temperature range	-50°C up to +45°C		

Toros Tracked Armored Vehicle

Source: "Russia Could Order Toros Tracked Armoured Vehicle for Military Units Deployed in the Arctic Region 11805162," Army Recognition, May 18, 2016, https://www.armyrecognition.com/weapons_defence_industry_military_technology_uk/russia_could_order_toros_tracked_armoured_vehicle_for_military_units_deployed_in_the_arctic_region_11805162.html

TTM 1901 Berkut Snow Mobile

The TTM-1901 Berkut is a snowmobile with a two-man heated cab and a rear cargo platform. It has skis in the front and tracks in the rear. The cab is much like an automobile interior with bucket seats, standard foot pedals, and a steering wheel instead of handle bars. Designed to transport personnel and tow skiers, it is built to order by the Nizhny Novgorod-based "NPO Transport" company using Oka car bodies and Lada engines.[62] The cab's heating system maintains a temperature of +18°C even if it is -50°C outside. The vehicle drives on snow regardless of its thickness at a speed of 35-40 km/h. There is a combat station for a machine gunner.[63] The Russian ministry of defense purchased 40 of these in November 2016.[64] This vehicle is currently in use by Russia's Arctic brigades (80th Independent Motor Rifle Brigade in Alakurtti and the 200th Independent Motor Rifle Brigade in Pechenga).[65] The vehicle has also been used by the Russian border guard as well as the Ministry Of Emergency Situations.[66]

TTM-1901 Berkut

Source: Vitaly Kuzmin, "Military-Technical Forum ARMY-2016 - Static Displays Part 3: Air Defence, Trucks and Wheeled Armored Vehicles,"2016, https://www.vitalykuzmin.net/Military/ARMY-2016-Static-part3. CC BY-SA 4.0.

T-80BV Main Battle Tank

T-80BV at 9 May 2010 military vehicles static displays in Luzhniki

Source: Vitaly V. Kuzmin, "T-80BV at 9 May 2010 military vehicles static displays in Luzhniki," Wikimedia Commons, May 9, 2010, https://commons.wikimedia.org/wiki/File:Russian_T-80BV.jpg. CC BY-SA 4.0.

The T-80B main battle tank is a variant of the T-80, which was produced only in small numbers. The T-80B is the first variant produced in quantity. Small scale production commenced in 1978. The T-80BV is an improvement on the T-80B, adding Kontakt-1 explosive reactive armor (ERA).[67] The T-80BV smoke grenade launchers were moved from either side of the main armament back to the either side of the turret and positioned between the turret side and the ERA panels. On the turret of the T-80BV, the panels are joined to form a shallow chevron shape. ERA is also fitted to the forward part of the turret roof to provide protection against attacks from above. The ERA provides a high degree of protection against anti-tank guided missiles (ATGM) which rely on a high-explosive anti-tank (HEAT) warhead to penetrate armor. Over the frontal arc, it does not provide any added protection against armor-piercing discarding sabot (APDS) or armor-piercing, fin-stabilized, discarding sabot (APFSDS) rounds. Some T-80BV tanks have been equipped with a dust flap under the glacis plate and some of them have been equipped with single line of ERA along the top of the hull. The T-80BV engine has a gas turbine, allowing the tank to be started in one minute at -30°C, compared to 45 minutes with an unheated diesel engine.[68]

Armored Vehicle MT-LB

MT-LB

Source: US Army Training and Doctrine Command, "MT-LB Russian Armored Personnel Carrier (APC)," Worldwide Equipment Guide, https://odin.tradoc.army.mil/WEG/Asset/MT-LB_Russian_Armored_Personnel_Carrier_(APC)

The wide track of the MT-LB makes it one of the world's best light armored vehicles for ice, snow, and marshes. The MT-LB is a general-purpose carrier and prime mover developed from an unarmored civilian tractor. Some versions are used as an APC with a maximum capacity of 11 dismounted soldiers. It is armed with two PKT 7.62-mm machine guns. Other weapons systems can be mounted on the vehicle for a variety of purposes. It has 7-14mm of armor, has a collective NBC protection system, and comes with a self-entrenching blade. The MT-LB has a large number of variants.[69]

NAME	VARIATIONS
MT-LB "Blade"	Bulldozer version
MT-LBu	Raised hull area for improved carrying capacity in 50+ of 60+ MT-LB variants
2S1	12mm self-propelled Howitzer
BTP-LB	Technical support vehicle
MT-SON	Ground surveillance radar (GSR) with the Pork Trough/SNAR-2 radar system.
RKhM	Chemical reconnaissance vehicle
MT-LBVM	Mounts a 12.7mm DSHK machinegun
MT-LB6MA	Upgrade with 14.5mm, twin 14.5-mm DSHK machineguns with a 7.62mm machine gun
MT-LB6MB	Upgraded APC with Modular Weapon Station includes the 30-mm cannon, 30-mmAGL, & 7.62-mm MG
MT-LB6MB3	FSV/APC upgrade with antiaircraft 23-mm GSh-23L twin cannons, 30-mm AGL & 7.62mm machine gun
MT-LB6MB5	APC/IFSV with Gsh-30K twin 30-mm anti-aircraft guns, 12.7-mm MG, 30-mm AGL & space for a single squad

Key Takeaways

A conflict with Russia over the Arctic itself is unlikely, but any conflict with Russia could involve Arctic campaigns or operations. Russia is more heavily vested in the Arctic than any country and certainly prioritizes the ability to fight there. Russia's investment in Arctic development and military capability will enable Russian military forces to operate and sustain themselves for extended periods of time, year-round, in isolated locations in the Arctic. Investment in maritime transit, primarily meant to support economic interests, also means Russia will be able to project and sustain power across Arctic waters to a significantly greater extent than any and all rivals. In the long run, infrastructure investment in overland infrastructure connecting Russia with the western European Arctic, in addition to promoting trade, will facilitate sustainment of forward-deployed Russian ground forces should a conflict occur. Russia would have an advantage within Russian territory and against any individual European Arctic country because of force strength, prepositioning, purpose-designed equipment, and extended ability to communicate and maneuver. ◆

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Russian nuclear-powered icebreaker

Source: Wikimedia Commons user ВикиКорректор, “Атомный ледокол “Ямал”,” Wikimedia Commons, June 25, 2009, retrieved from: https://commons.wikimedia.org/wiki/File:Полюс-2.JPG. Public domain.

Russia in Africa

By **Rick Burns,** OE&TA

In October 2019, Russian President Vladimir Putin co-hosted with Egyptian President Abdel Fattah el-Sisi a two-day Russia-Africa Economic Forum in the Black Sea resort town of Sochi. Evidence of African interest in greater Russian investment in African countries can be seen in the attendees—over 6,000 representatives of all 54 African nations, including 43 heads of state, business and political leaders, and experts—who came to discuss and sign agreements.[1] Discussions considered a vast array of interests, including energy and infrastructure development, modern and high-tech mineral extraction and processing, agriculture, digital technologies, oil and gas exploration, medicine, science and education.[2]

Russia cannot compete with the United States and, especially, China in economic terms. Because of this, Russia is selective and opportunistic in its investing in places like Africa.[3] As the United States has moved away from investment in Africa and has prioritized attention in other areas of the world, Russia is making inroads into African countries that are hungry for foreign investment and security support. According to the Kremlin, the Sochi conference resulted in $12.5 billion in deals. These were, for the most part, memorandums of understanding and may not materialize as actual investments, in the end.[4] If only symbolic, however, the conference does represent a Russia aggressively pursuing a place on the international stage and an Africa interested in the attention.[5]

Russia is dusting off its Cold War playbook and engaging with old African partners, after post-USSR retrenchment. Putin is positioning himself as liberator and protector of African sovereignty, an old and effective argument against relationships with the old colonialists from the West.[6] In an interview with TASS, Putin stated that "Our country played a significant role in the liberation of the continent, contributing to the struggle of peoples of Africa against colonialism, racism, and apartheid."[7] Konstantin Malofeev, billionaire Kremlin benefactor and chairman of the newly-founded Moscow-based International Agency for Sovereign Development, said during one of the Sochi conference sessions, "Regime change is promoted by the West to keep African countries scared and weak, so the West can influence them. And we in Russia know what we're talking about, because we've come a long way to win our economic sovereignty."[8]

The following Carnegie Endowment for International Peace table gathered from the Kremlin's press service digest (available on kremlin.ru) for the period from January 2015 to August 2019 shows the official visits of African heads of state to Russia since 2015.[9]

	Country	President	Dates
1	South Africa	Jacob Zuma	2015
2	Zimbabwe	Robert Mugabe	2015
3	Sudan	Omar al-Bashir	2015, 2017, 2018
4	Guinea	Alpha Condé	2016, 2017
5	Central African Republic	Faustin-Archange Touadéra	2018
6	Rwanda	Paul Kagame	2018
7	Gabon	Ali Bongo Ondimba	2018
8	Senegal	Macky Sall	2018
9	Zimbabwe	Emmerson Mnangagwa	2019
10	Angola	João Lourenço	2018, 2019
11	Congo	Denis Sassou Nguesso	2019
12	Mozambique	Filipe Nyusi	2019

Whether Putin is able to match results with his rhetoric is less important to him than the appearance of Russian relevance and the dilution of US and Western influence. Russia sees Africa as a means to weaken the West's international dominance, attract partners in crafting a more advantageous multipolar world, and exploiting economic opportunities—particularly for Russian companies hit hard by international sanctions.

Putin also sees African regimes as allies in supporting its interests in international organizations such as the United Nations; the African countries make up about one-quarter of United Nations member states. Russia uses strategic partnerships and debt relief—Putin announced forgiveness of $20 billion in African debt at the October 2019 Sochi Conference—as useful ways to encourage allies to back key votes, such as the 2014 General Assembly resolution that criticized Russian annexation of Crimea. Twenty-nine African countries voted or abstained from the resolution, with six not showing up for the vote.[10] Other votes on Syria and the militarization of Crimea, the Black Sea, and the Sea of Azov have shown African support for Russia's agenda in international organizations.[11]

Two areas where Putin's Russia is gaining influence and positioning itself with African leaders is in military sales and services and nuclear energy.

Military Sales and Services

Russia is the second largest supplier of arms in the world and a major supplier to African countries. Between 2013 and 2017, Russia supplied 39 percent of the weapons sold to African countries.[12] Military contractor Yevgeny Prigozhin and his private military contractor company the Wagner Group have been used to put down insurgencies in Central African Republic (CAR), which probably is motivating other African countries, including Burkina Faso, Chad, Mali, Mauritania, and Niger to explore opportunities for Russia's direct assistance with their own internal conflicts.[13]

Russia's growing influence in the country began in 2017, when it received an exemption to the UN arms embargo that restricted CAR's ability to build and resource its security forces—allowing CAR to purchase a modest quantity of light arms. The UN arms embargo dating back to 2013 required approval by the UN Security Council's CAR sanctions committee, which included France and Russia on its fifteen-member committee. An uptick in violence created a dilemma, which France attempted to solve by offering to give CAR 1,400 AK47 rifles it seized in Somalia in 2016. Russia's objection to that proposal led to an exemption for Russia to donate AK47s, sniper rifles, machineguns and grenade launchers in December 2017 to stanch the immediate crisis.[14]

Moscow exploited this foothold to expand its military and security presence there, primarily at France's expense. Over the last decade and a half, Russia has continued to increase the number of civilian and military trainers it sends to CAR. In 2018, 175 trainers—mostly Russian military contractors—established an expandable camp at Béréngo palace, which is about thirty-five miles from the capital Bangui. With CAR's volatility and the government's fragile hold on the country, Russia is positioning itself as a welcome ally in the fight to gain government control of the territory held by armed groups.[15]

Russia's relatively small investment in CAR contributes to its larger narrative of being a power broker on the world stage. Russia can lay claim to a major role in the peace and stability process in volatile CAR while, at the same time, benefiting from the sale of arms and other security services. The CAR government, suspicious of the West, is willing to strengthen ties with Russia, whose less rigid stance on human rights and willingness to supply needed support to its military is welcomed.[16]

Nuclear Energy

TEnergy sufficiency is, arguably, one of the critical needs and priorities of African countries. These countries face a persistent lack of access to electricity, which has helped to stymie development on the continent. Despite progress in several countries, such as Kenya, Ethiopia, Ghana, Senegal, and Rwanda, current and planned efforts at upgrading energy services will not outpace population growth. In order to meet current expectations of the African Union's "Agenda 2063" vision, countries will be required to triple the average number of people gaining access to electricity every year from around the current 20 million to over 60 million.[17]

During the Sochi Conference, Russia and Ethiopia signed an agreement that further cemented a relationship begun in 2017 to cooperate in building a nuclear power station in the next decade. Ethiopia's Ministry of Innovation and Russia's State Atomic Energy Corporation Rosatom signed the agreement, which includes developing a foundation for an Ethiopian nuclear industry—including writing safety regulations, developing storage facilities for nuclear fuel and waste, and plans for building a 3GW nuclear plant. Other ambitious projects being discussed include reactors to create radioactive isotopes for medical, agriculture, and research purposes and the construction of an Ethiopian Center for Nuclear Science and Technology.[18] The agreement that Ethiopia signed with Rosatom is one of several agreements signed between African countries and Rosatom. The largest of these agreements is the $29 billion Dabaa plant in Egypt, with other arrangements with South Africa, Rwanda, Uganda, and Ghana and looser cooperation agreements with Sudan and the Democratic Republic of the Congo.[19]

Rosatom is a Moscow-headquartered international corporation focused on the generation of electricity and meeting other subsidiary and corollary needs. The company offers nuclear fuel cycle, uranium mining, fuel and enrichment, and power generation projects, as well as nuclear medicine, non-nuclear equipment manufacturing, machine building, engineering, and maintenance services.[20] Rosatom, founded in 2007, is the result of Russian president Vladimir Putin's consolidation of the Russian nuclear industry into a vertically integrated state-owned company with 360 subsidiaries. The world-wide footprint includes forty countries and positions it as the second largest nuclear power company in terms of installed nuclear capacity and number of nuclear units in operation. Its portfolio of overseas projects for the next decade exceeds $133 billion, although most of the projects in this estimate are framework agreements that have not been built yet.[21]

Critics point out that nuclear reactors may be too expensive for poor countries and not fit the needs of the poorest citizens. No nuclear projects on the African continent have been finished and only two contracts, with Egypt and Nigeria, are in place; completion of other nuclear projects are years into the future. The promise of generous loans— Egypt has borrowed

85% of the construction costs for its nuclear reactor from Russia—and long-term supply contracts are attractive incentives for Russia, but are also invitations for corruption and glacial improvement in delivering electricity to the poorest areas of African countries. An industry recommendation states that no single facility should provide more than ten percent of a country's total power. If a country invests in large reactors, it may not have the infrastructure to push power to those in greatest need of electricity.[22]

Summary

Russia's investment in Africa is on the rise, but it may be less than advertised, in the end. Russia is unable to effectively compete in direct competition with the West and China, so its investments will be opportunistic and focused on places where others are less focused.

With the United States concentrated on other areas of the world and viewing Africa as a lower priority, Russia is seeing opportunities on the continent. The economic benefits of new markets and undeveloped African natural resources are inviting to sanctioned Russian companies. African countries suffering from internal conflicts offer new prospects for increased Russian arms sales and security services. African countries are interested in Russia's less restrictive human rights and other requirements associated with trade and development. These relatively limited economic benefits, however, are side benefits to Putin's even more compelling reason for investment in the African continent, the furtherance of the narrative that Russia is a global power. To the extent possible, Putin will also use investments in African countries to minimize US and Western influence. ◆

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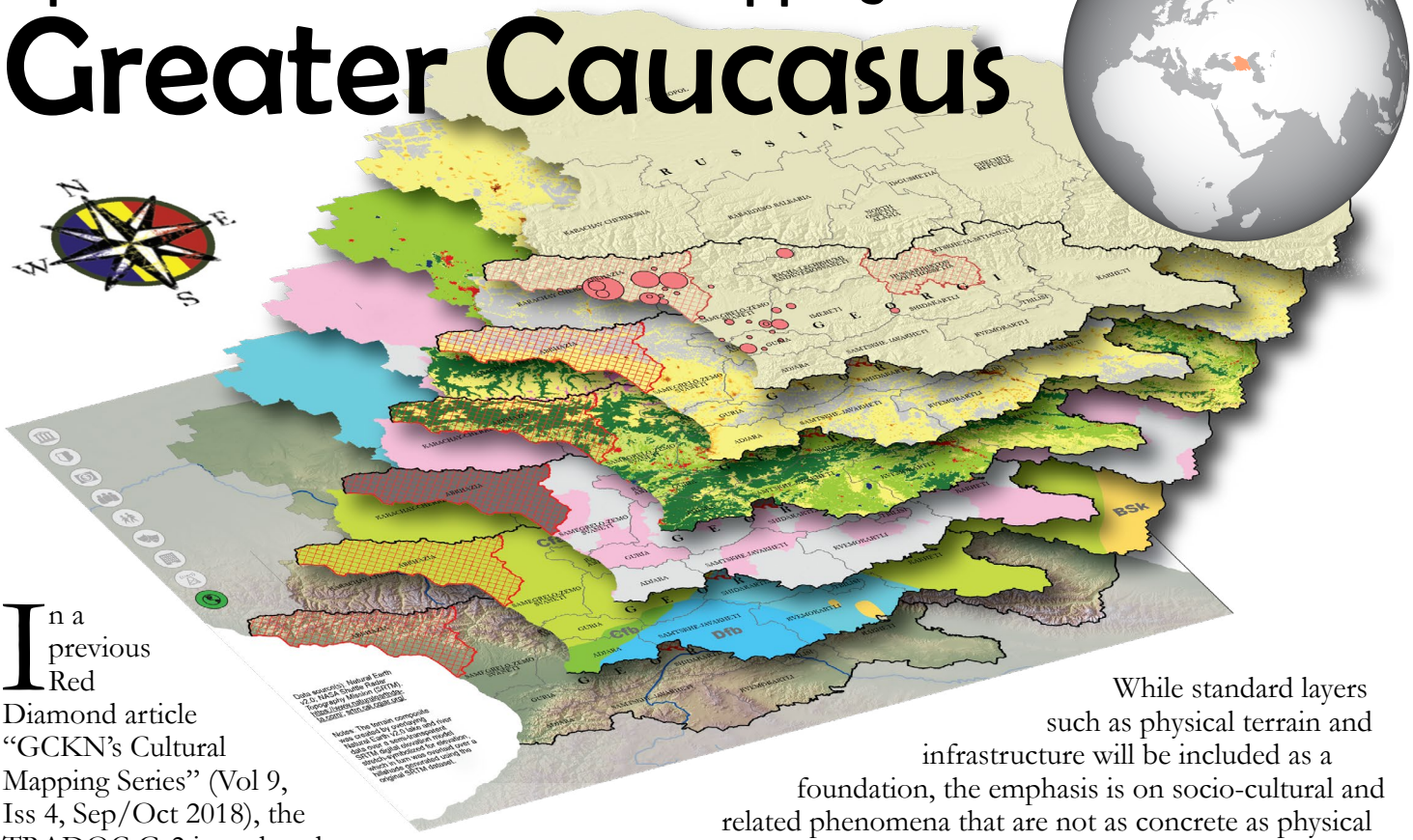
Operational Environment Mapping Series

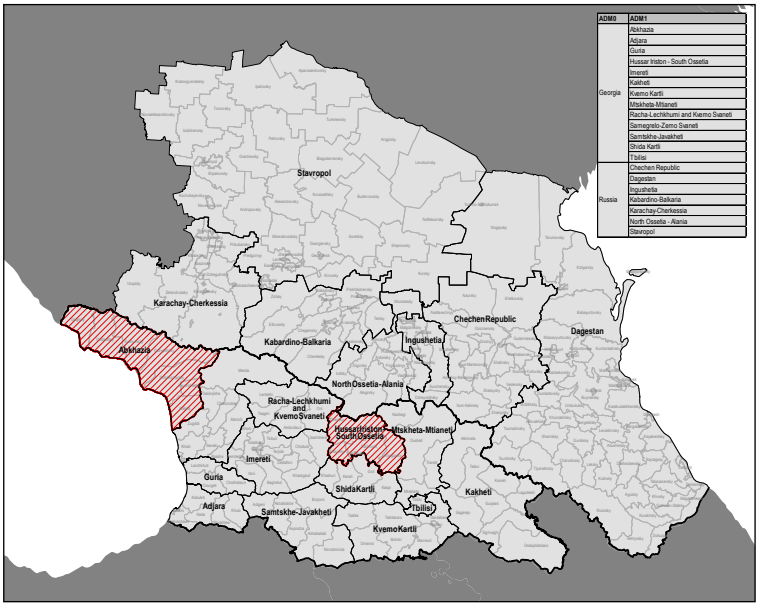
Greater Caucasus



In a previous Red Diamond article "GCKN's Cultural Mapping Series" (Vol 9, Iss 4, Sep/Oct 2018), the TRADOC G-2 introduced a new product series intended to combine geospatial and socio-cultural analysis to enhance Operational Environment (OE) understanding, with the pilot project on Nigeria released in January of 2019 (available at https://community.apan.org/wg/oekn/m/mediagallery/266644). This series—since renamed "Operational Environment Mapping Series" (OEMS)—continues under the direction of the Operational Environment and Threat Analysis (OE&TA) directorate with a second installment on the Greater Caucasus region (the Republic of Georgia, and the Russian Federation's North Caucasian Federal District) slated for production.

The OE&TA directorate envisions a similar product to the Nigeria pilot, but continues to refine and enhance the methods, analysis, and delivery to better fit the needs of the end-user. As in the pilot, the OEMS will include a short introduction to the Greater Caucasus OE and a number of map composites generated from a pool of geospatial layers that when combined help tell different stories about the OE. In addition, the individual layers themselves will be included in the product so that the end-user can generate his or her own composites to help form a narrative that may help answer specific questions.

While standard layers such as physical terrain and infrastructure will be included as a foundation, the emphasis is on socio-cultural and related phenomena that are not as concrete as physical layers and in many OEs present a challenge to obtain or produce. Many of these layers are not readily available in a geographic information system (GIS) format and must be painstakingly generated from spreadsheets, scanned materials, or translated textual descriptions. The OEMS Greater Caucasus provides these layers while also going a step further by providing analytic layers produced by utilizing existing geospatial analysis methods or by developing new ones.



OEMS stand-alone layers come in six general categories:

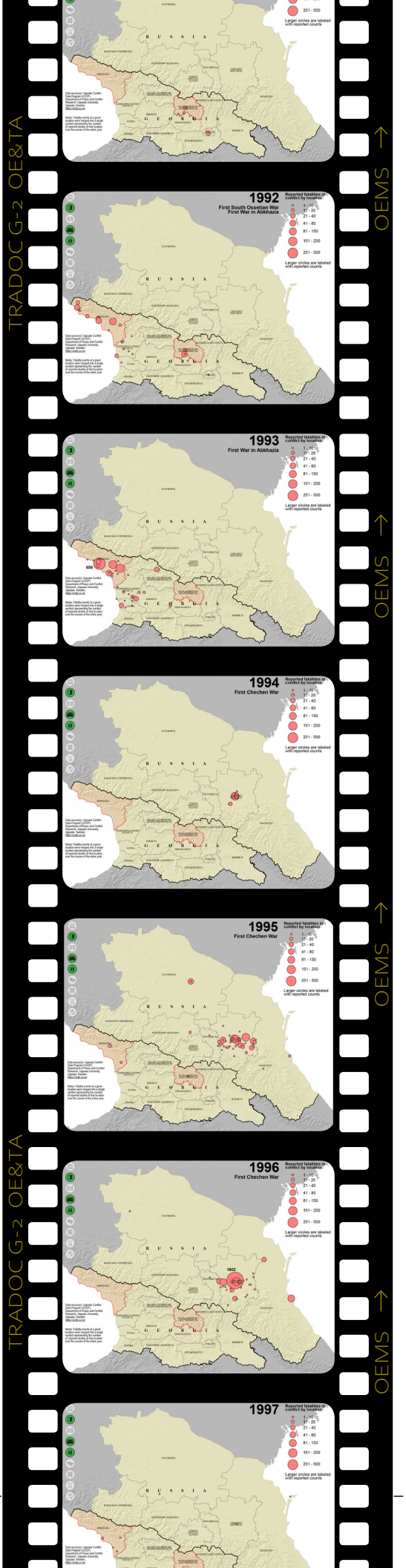
- **physical** – generally available already in a GIS format, includes such layers as topography, land use/land cover, hydrography, climate, and infrastructure. Multi-spectral imagery may also be included in this category. A standard mission folder will include most of these layers.
- **socio-cultural** – layers compiled from census data, on-the-ground research, or interpretation of characteristics of physical layers, including population density, ethnicity, and economic status. A standard mission folder typically lacks these layers.
- **events** – layers compiled from official sources or media reporting, such as elections, demonstrations, or violence.
- **perceptions** – layers compiled from polls, surveys, or social media, such as election results, leadership approval ratings, and general public attitudes.
- **temporal** – layers depicting chronological phenomena such as migration or any changing conditions over time.
- **analytic** – variables derived through the use of a proven methodology, such as hot spot analysis depicting patterns of violence or patterns of movement.

This combined array of geospatial layers form an enhanced mission folder, or an "OE in a Box" that will provide the end-user with a comprehensive picture of the OE as well as the potential for generating a multitude of composites.

While the Nigeria pilot was largely a static document, the OEMS Greater Caucasus seeks to provide an interactive environment, whereby the end-user can manipulate the OEMS data layers and add their own existing layers to form composites that meet their own specific needs. At the same time, these external layers can be harnessed and vetted to feed the baseline array.

As part of creating a realistic training environment, the OEMS Greater Caucasus will be able to directly inform Decisive Action Training Environment (DATE) Caucasus region. Not only will this product lead to the inclusion of more specific and real world influenced conditions, it will provide geospatial representations of those conditions.

The OE&TA will collaborate with other TRADOC G-2 organizations to ensure continuity of narrative and to identify further ways in which this product line can be utilized. OEMS Greater Caucasus will represent the second evolution of TRADOC G-2's efforts to fuse socio-cultural information with geospatial capabilities. As part of this evolution OE&TA will document both its successes and challenges with the development and delivery of the product, and utilize that record to inform discussion among the training community and shape future practices. ◆



Maneuver Defense: Battalion Tactical Group (BTG)

Tailored Combat Power and Tactics

by **Wayne Sylvester**, OE&TA; **Matt Matthews,** OE&TA; and **Jon H. Moilanen,** USA Ret

This is the first part of a two-part series that presents Russian tactics, techniques, and procedures and tactical setting that a Battalion Tactical Group (батальоннуе тактическая группа - BTG) may employ in a maneuver defense (маневренная оборона). Terms used throughout the article are those used by Ground Forces of the Russian Federation (*Сухопутные войска Российской Федерации* – SV) in doctrine and related military articles. The Russian General Staff considers the maneuver defense the "fundamental type of defensive posture."[1] The SV uses a maneuver defense in order to progressively attack a penetrating aggressor force by using successive battle positions to inflict casualties, gain time, and preserve forces and means. The maneuver defense is directed when there are insufficient SV forces and means to set a strong positional defense and the SV can give ground until conditions are favorable to counterattack.[2]

A BTG is a combined arms tactical organization based on a motorized (mechanized) rifle or tank battalion, with integrated subunits. The SV's reorganization places maneuver brigades directly subordinate to an army with maneuver regiments subordinate to divisions. At present, brigades are only subordinate to an army and are not found under a division organization. Both brigades and regiments are capable of task organizing a battalion to create a BTG.

BTGs maintain the highest level of readiness in a brigade or regiment. Any soldier vacancies or equipment shortages are immediately backfilled from other units in the brigade. Maintaining a BTG in this manner allows the SV to sustain the unit's capability to deploy within 2-hours of alert.[3] The allocation of additional forces and means are those the higher echelon commanders determine are necessary to accomplish an assigned mission.

Typically, a BTG operates as part of a brigade, acting as the main element of the brigade's defense when the SV conducts large-scale combat operations. In this example, the BTG will conduct a maneuver defense forward of the brigade's main defense and as it maneuvers back it will ultimately reoccupy a position in the defensive belt.[4] The composition of a motorized (mechanized) or tank BTG will include the most modern weapons platforms crewed by contract (*Kontraktniki*) soldiers with a limited number of conscripts found within the ranks.

Russia continues modernizing the SV with both new equipment and manning changes. A significant change in the manning area is the increasing reliance on professional or contract soldiers to fill the ranks in addition to one-year conscripts. Contract soldiers agree to an extended period of service that allows the SV to field units with higher levels of readiness and battlefield skills. As more contract soldiers become available the number of BTGs in a brigade will increase from the current 1-2 to the ultimate goal of 3 BTGs in a brigade. Experts remain uncertain as to the number of BTGs a regiment is capable of generating.

Assessing the capabilities and limitations of a BTG is a constant comparison and contrast to determine the correlation of relative combat power. Organizational diagrams are only a starting point in unit assessments, and further study must consider aspects such as the type and status of weapon complexes, equipment, manning readiness, and available logistic support to prepare for and sustain tactical actions. Knowing the leadership experience of commanders from senior to junior levels is another analytical measure of, for example, the SV unit's ability to incorporate recent experiences and tactics employed in Syria and the Donbass.[5]

At the soldier level, the combinations of professional contract soldier versus conscript can be a telling indicator of readiness. Open-source estimates suggest that many SV brigades or regiment-sized units at this time may only be capable of fielding a single battalion-sized unit manned by contract soldiers.[6] The type and number of weapon complexes among units can also differ significantly. A motorized (mechanized) rifle brigade with

light armor MT-LB troop carriers presents a distinctly different array and combat power from a unit fielded with BMP-2 or BMP-3 armored fighting vehicles.[7]

For the purpose of this article's tactical discussion, the BTG is a fully modernized unit with experienced leaders and soldiers. Sustainment is comparable to that expected of a supporting effort in a brigade zone of responsibility. The commanding Army allocates operational and strategic combat multipliers to provide intelligence, surveillance, and reconnaissance, deception, prioritized long-range fires, and other support to a brigade's defensive zone. These supporting forces and means provide area coverage in the form of fires from the brigade artillery group (BrAG), division artillery group (DAG) or army artillery group (AAG), jamming and electronic attack from the electronic warfare company (REB) organic to the brigade structure, air defense coverage from the Aerospace Forces, as well as coordination of intelligence from special operations forces (SSO) or local guerillas. This combination of enablers indicates that the SV tactical concepts expect a brigade, its units and subunits, to be capable of defending a larger zone of responsibility of up to a 20km frontage in comparison to former Soviet units.[8] The continuing development of BTG and brigade capabilities in an increasingly non-linear or fragmented battlefield may see the brigade's frontage extend as far as 50km.[9] Extended coverage by reconnaissance, improved command and control capabilities, and increasing range and precision of indirect fire complexes all contribute to the expansion. The SV uses the term "*complexes*" to label equipment sets and supporting systems; i.e. an air defense complex includes the radars, guns or missiles, and command and control computer networks.

The capability to effectively control and direct both targeting sensors and precision fires in the strategic, operational, and tactical echelons is possible through the C2 organization known as the National Defense Management Center (*Natsionalnomu Tsentru Upravleniya Oboronoy*-NTsUO).[10] The NTsUO functions at the SV strategic-operational echelons and directs fires down to the tactical echelon. It maintains continuous visibility of the battlefield using all available sensors from satellites down to individual soldier observers. This capability allows the collection, analysis, and assessment of all detected battlefield actions and the resulting rapid adaptation to changing conditions. This unit conducts unified C2 using automated mobile field complexes to direct SV units and subunits using complexes such as the YeSU TZ (*Yedinaya avtomatizirovannaya sistema upravleniya takticheskim zvenom*), and Strelets, part of the Ratnik soldier kit (*комплекса разведки, управления и связи* –КРУС (KRUS), *Andromeda-D*, or *Akatsiya-M*.

The Army commander's maneuver defense plan includes actions to create a tactical situation that progressively draws an aggressor force into committing its effort along a particular axis or corridor. The plan integrates a deliberate and calculated use of deception (*маскировка*), radio-electronic battle (*радиоэлектронная война* – REB), and targets for long-range fires at selected times and locations, to defeat or destroy the aggressor force in support of the higher SV commander's plan.

The second section of this article presents a tactical vignette that describes and illustrates integrated BTG combat power with condition-prompted decision points for effective conduct of maneuver defense tactics. Figure 1 depicts an example task organization with additional forces and means as well as elements that serve to degrade or defeat aggressor command and control (C2) or higher echelon support. Note that the SP artillery battalion, as an attachment is directly subordinate to the BTG commander.[11]

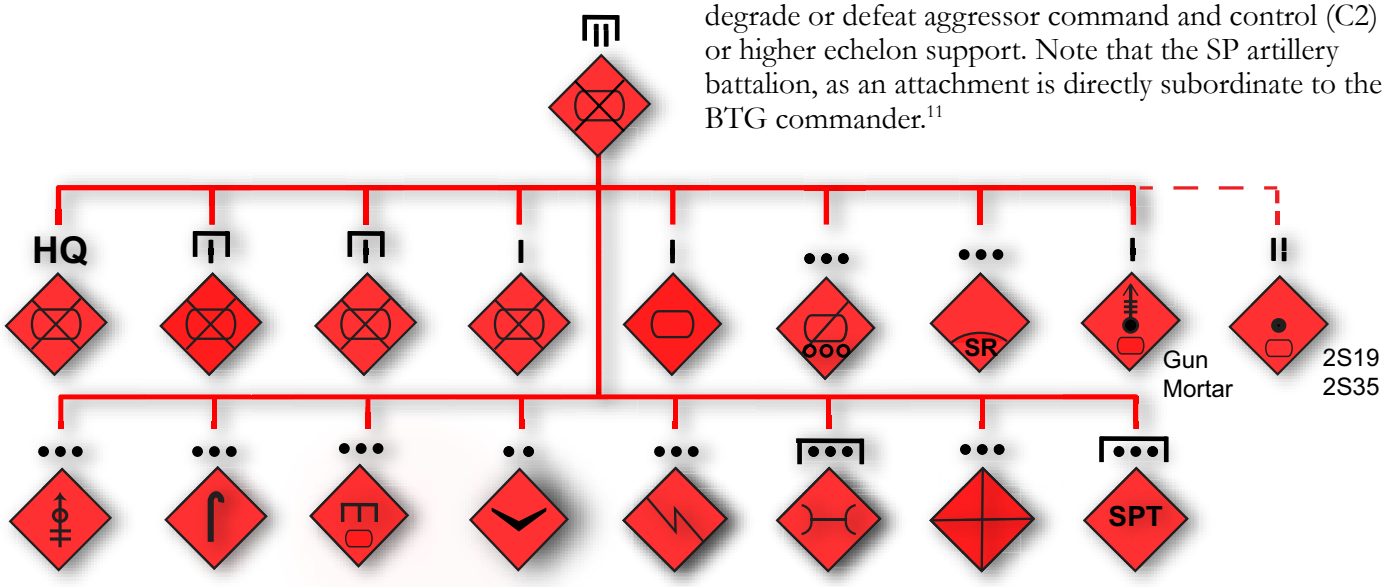


Figure 1. Motorized (mechanized) Rifle BTG (example).
Source: TRADOC G-2 OE&TA. " Motorized (mechanized) Rifle BTG (example)." TRADOC G-2 Operational Environment & Threat Analysis (OE&TA) Directorate. 2019.

Maneuver Defense Overview

The purpose of a maneuver defense is to draw an aggressor force into the depth of the defense where it is defeated or destroyed using successive kill sacs, ambushes, and counterattacks from the flanks. The SV views artillery as the principle means of engaging and destroying the attacking aggressor forces. Artillery units and subunits will deploy forward to gain the best range advantage possible while retaining security and maneuverability. SV defensive tactics include unit actions with the following general characteristics to achieve stability and activeness of the maneuver defense:[12]

- Maneuver of units throughout the width and depth of the security and main defensive zones.
- Maneuver by fire with concentrated fires on a high-payoff and high-value targets.
- Battle formations widely dispersed across the front and in depth to strike aggressor forces
- Non-contiguous or non-linear front
- Deception to achieve surprise and to set anti-tank ambushes
- Non-templated or non-uniform formations along the front and in depth
- Aggressive, intense, and ferocious combat to overwhelm the attacking aggressor force
- Seizure of opportunities to take advantage of changing situation and transition to decisive counterattacks

To accomplish this, subunits conducting maneuver defense employ integrated fires, unmanned aerial vehicles, electronic warfare, and integrated air defense as essential elements of the defending maneuver forces. In the SV, units and subunits denote specific capabilities, basically, a unit is capable of self-sustained actions and subunits require support to accomplish tasked missions. Maneuver units and subunits serve to draw the aggressor into kill sacs without becoming decisively engaged. The maneuver defense uses predefined successive engagements with indirect, electronic, and direct fires to defeat and destroy the aggressor. The techniques used by the SV include a series of sequenced withdrawals under the direction of the brigade or battalion commander. The BTG and brigade uses a combination of maneuver and positional defensive actions to create a sequenced and interlinked series of engagements through the depth of the defense.

The BTG maintains continuous contact as it draws aggressor maneuver forces into the depth of the defensive zone. To maintain contact the BTG uses maneuver force reconnaissance, unmanned complexes, both ground and air, electronic warfare complexes, and supporting forces and means from higher echelons. Elements such as Ministry of Defense special operations forces (*командование силами специальных операций*) – KSSO or *спецназ* GRU Spetsnaz) will conduct direct action or reconnaissance in the depth of the aggressors territory.[13, 14] Observations by all SV units and subunits are shared through automated C2 complexes as described above.[15]

As the aggressor maneuver units penetrate into what it perceives is the main defensive zone, its combat support and combat service support must displace and follow at probable distances to provide timely logistics and be able to react to front-line tactical contingencies. At designated locations and timing, the BTG uses preset fire ambushes to defeat or destroy aggressor critical combat power, C2, and following support forces. The commander's plan designates ambush sites and/or fire sacs with integrated supporting direct fires, minefields and obstacles to slow the aggressor force. These recurring actions cause the aggressor attack to culminate before achieving its tactical objectives and set the conditions for its destruction or defeat. Key tactical maneuver defense actions are to cripple effective aggressor C2, deny situational understanding of environmental variables, and prevent effective sustainment of the attacking forces.

The actions in a maneuver defense allow SV forces to withdraw unopposed or withdraw under pressure as directed in the brigade commander's plan. He may also order strongpoints or zones of continued positional defense in order to channel an aggressor into predesignated fire ambushes. As aggressor forces extend their axis of attack into the depth of the maneuver defense zone, maneuver and support complexes are degraded, become less cohesive, and are more susceptible to BTG counterattack. The BTG counterattack can be primarily integrated fires and will include defensive fires and a combination of ground and aerial maneuver to defeat or destroy the aggressor.

The BTG commander focuses a keen situational understanding of the aggressor organization, terrain and weather, his own functional capabilities and limitations, and probable aggressor offensive actions to determine how and when the BTG executes its maneuver defense. The BTG is expected to use innovative actions and initiative to accomplish the commander's plan and is allowed prudent latitude in the actions employed to accomplish the mission. SV units composed of conscript soldiers continue to rely on practiced battle drills to

conduct missions. The BTG, however, will use battle drills to accomplish tactical actions as well as integrating supporting forces and means to maintain awareness and launch rapid strikes, at a critical and calculated point in time, when the aggressor force exposes a key combat power capability.

Contemporary assessments recognize that emergent technologies and evolving integration of capabilities provide the BTG commander with significant advantages at the tactical level.[16] Capabilities at the strategic and operational levels inform and assist a tactical commander in creating the conditions for successful missions at the tactical level.

At echelons above the brigade, the Army employs complexes to disrupt or even defeat information and situational awareness of an aggressor.[17] Examples include embedding cyber viruses in key aggressor infrastructure for execution at the selected critical time in an initial period of warfare. Electronic warfare means penetrate aggressor equipment operating parameters for electronic attack at selected times and conditions. Global positioning system (GPS) frequencies and data can be scrambled or disrupted to provide false information during an aggressor's decisionmaking cycle.[18]

Unmanned aerial vehicles (UAVs), from micro-UAVs to larger unmanned complexes at higher altitudes, some used in swarm techniques—some used in discrete individual or small group missions—will conduct tasks with deception and operational synchronization to achieve a commander's intent. Whatever the complexes and at whatever echelon of command and control, logical high-payoff and high-value targets will continue to be aggressor C2, communication, reconnaissance and surveillance, and electronic navigation complexes.[19]

Given the possibility of electronic reconnaissance complexes being corrupted by an aggressor, a component of intelligence collection remains human intelligence. Observation and reporting from scouts, sniper teams, fellow commanders, agents, or sympathetic civilian or official in an area of interest are integrated by the SV to provide current situational awareness.[20]

Command and Control

The BTG commander establishes a forward command post (FWD CP) with a small group of selected staff members. Location of the CP provides current or near-real time information, intelligence, and effective communications that facilitate situational awareness and visual understanding of the tactical setting for command decisions.

The BTG commander may also occupy a small command observation post (COP) to personally observe critical actions of the defense, and direct fires and maneuver to achieve his maneuver defense mission.[21] The COP normally includes the BTG commander, the senior fire support commander or staff coordinator in the BTG, a communications element, and security team. An automated command and control system enhances the commander decisionmaking process and speedy selection and execution of fires and complementing complexes.

The main CP contains the majority of the BTG staff with the battalion chief of staff directing the overall staff and support for the mission. If a deception CP is to be employed as part of higher headquarters information warfare (informatsionnaya voyna - IV) operations in the BTG zone, those assets would be provided by the higher headquarters to present a realistic multi-sensor signature to deceive the aggressor.

The BTG receives logistics support from a Material Technical Support (MTO) battalion found in all SV maneuver brigades.[22] The MTO commander establishes and controls resources and support of the BTG based on the commander's plan. The MTO command post conducts forward delivery to sustain the BTG for all classes of supply, transportation, maintenance, medical, other services, and incorporates any logistics assets of affiliated units supporting the BTG. MTO platoons organic to maneuver battalions provide support and are also subunits of the MTO companies subordinate to the MTO battalion. The MTO battalion establishes a forward and main CP. The forward CP locates between the brigades first and second echelons with the main CP in the rear area or off the main aggressor avenue of attack.[23]

Reconnaissance and Intelligence Actions
(*Разведывание*) The SV retains a simple concept and effective description to support decision making and application of available forces and means by the commander. Situational awareness and understanding are products of a functional system of reconnaissance, intelligence, surveillance, and target acquisition encompassed by the term, *Razvedka*.[24, 25] Razvedka, as a single label, is used by the Russians, "to describe all actions necessary to achieve a better understanding of the enemy."[26] While introduced at the end of the Soviet period, Razvedka continues to be expanded and refined as a key element of Russia's New Look organization.

These capabilities are integral to effective integrated fires and air defense complexes as a comprehensive system of systems. Reconnaissance combines with security functions to support the information domain and

intelligence requirements. Reconnaissance and security (R&S) actions are explicit tasks for all echelons of a unit in order to gain, sustain, and improve situational awareness and understanding of current and probable future operations. Similar recurring expectations are tasks of area security and local security.

Typical tactical reconnaissance missions orient on the aggressor force to determine main avenues of maneuver or attack. Security considers the risks of tactical conditions and knowledge of habitual aggressor behavior, and corresponding force protection actions to shield the main defense from unexpected attacks.

The BTG employs Razvedka with task-organized and affiliated sensor capabilities to provide timely intelligence and identify specified aggressor capabilities to monitor, target, and strike at an advantageous time and location. Using the allocated combinations of dismounted, mounted, manned and unmanned aircraft, unmanned ground platforms, and other technical sensors the SV works to accomplish information dominance.[27] The configuration of capabilities and timing of employment consider at least three key aspects of collecting information with cueing, mixing, and redundancy. The means to counter the aggressor can include direct and indirect fires as well as electronic warfare and deception. The layering of Razvedka throughout the BTG defensive zone is mission-oriented by task and employs mobile, stationary, or a combination of those capabilities.

As automated command and control system capabilities improve, the speed of identification and prioritization of targets improves timely action to engage a target with selected integrated fires or other capabilities. In addition to providing a high degree of reliability to committing fires on high value targets, Razvedka and a complement of information warfare (effects can enhance predictable and degraded impacts on the cognitive agility of an aggressor. Deceiving or decreasing the skills, moral resolve, and ability of an aggressor to act effectively is a fundamental aspect of seizing the initiative, creating tactical opportunities, and applying combat power in an integrated and synchronized manner. The Razvedka system also provides subsequent data and analysis to estimate and/or confirm battle damage assessment on specific targets.

As a component of SV tactical actions, commanders conduct a personal reconnaissance as part of mission planning and execution to visually study aggressor disposition, terrain, and other environmental conditions. Tactical actions include observation posts (OPs) as a small team oriented on a given zone or location. The brigade will most likely also establish a forward detachment (*Peredovoi otriad*) using a reinforced maneuver battalion such as the BTG. In a defense the forward detachment establishes a series of supported positions astride the most likely avenue of advance, to engage, delay, or destroy the attacking aggressor force.[28]

The R&S assets in the BTG zone anticipate direct action combat, and plan for transfer of the battle to security elements of the first defensive echelon. A combat security outpost (боевое охранение - CSOP) conducts defensive actions typically within supporting direct fire range of a first echelon.[29] A grouping or series of CSOPs—formed by platoons, squads, or reinforced teams—provide early warning along probable aggressor main and secondary axes of advance in a defensive zone. The CSOPs disrupt aggressor momentum and deceive the aggressor as to the actual main defensive array and *kill sacs*.

The R&S functions and execution of fires with maneuver can include:

- Identifying the approach and entry of the aggressor into an assigned zone.
- Disrupting the momentum of aggressor movement and/or maneuver.
- Defeat of aggressor reconnaissance.
- Support counterreconnaissance tasks to destroy aggressor reconnaissance.
- Deceive or misdirect the aggressor's forces as to the actual location of the main body main defensive array.
- Act as a stay-behind capability to maintain reconnaissance and surveillance situational understanding of follow-on forces, provide targeting of critical C2 nodes and logistics, and conduct direct attack.
- Assists in the main body transition from defensive to offensive actions.

Razvedka, in its current and future capabilities, assures the BTG commander that his senior leaders have used depth and deception to enhance tactical success once an aggressor enters his defensive zone of action. Fires and maneuver will occur well forward of the BTG area of responsibility, integrated into a higher commander's mission, and be able to respond to contingencies as the aggressor attempts to navigate through the security zone of the BTG's higher headquarters.

Integrated Fires and Air Defenses

The senior commander's plan uses the integrated direct fires of the BTG with indirect fires of artillery groupings, REB, air defense, and engineer obstacles to destroy first echelon aggressor C2, artillery, tank, and mechanized units.[30] The plan task-organizes artillery at higher echelons with C2 for prioritized mission execution. The artillery groups provide fires from brigade, division, and may even include support from combined arms army (CAA) or tank army assets. The BTG commander directs, in addition to artillery and multiple rocket launcher (MRL) artillery, antitank and anti-aircraft weapon complexes organic or task-organized to the BTG to mass fires or precision engagements in his defensive zone. Additional fires complexes and C2 operate from within the zone to execute higher echelon fire missions and synchronize integrated fires within the zone and/or beyond the BTG zone.

A reconnaissance fires system (RFS), sometimes called a reconnaissance fires loop, is an operational fires executing capability that directs integrated fires that can lead the tactical actions of the BTG. The intelligence and situational understanding from the Razvedka processes enable command decisions at higher C2 echelons to conduct precise point or area targeting with near-real time fire missions on high value targets.[31] Selective capabilities can provide semi-autonomous and/or autonomous fires mission execution, or can be controlled in a standardized approval process by designated leaders. If automated fire control complexes are disrupted by an aggressor, backup manual or predetermined nomogram calculations indicate the volume and timing of firepower required to employ against selected targets.[32]

Precision fires are a growing capability in the SV for attacking targets in dynamic tactical situations; however, massed artillery, gun, or multiple rocket fires often have debilitating effects beyond destruction of a specific target.[33] Massed fires, including thermobaric munitions, can cause a profound paralysis or psychological trauma of the aggressor leaders and soldiers experiencing or witnessing such an attack.

An integrated air defense system (IADS) is a key component of the integrated fires and C2 system that provides early warning and vectors of approaching aggressor aircraft for targeting by selected air defense complexes. Air defense subunits include numerous low altitude man-portable air defense missile complexes, as well as the use of other unit weaponry, in each of the BTG's units. The brigade positions mobile air defense complexes including gun and low-to-medium altitude/range missiles and other mobile surface-to-air missiles in the BTG defensive zone to provide layered air defense coverage. Air defense complexes at higher echelons provide additional layers of air defense coverage to counter medium-to-high altitude aggressor targets. The combination of artillery, rockets, and air defenses as an integrated fires and C2 system supports an expectation of degraded or minimal aggressor aircraft influence on the BTG's tactical mission.

The SV brigade commander determines how to most effectively use fires to create the conditions for successful maneuver of the BTG, and uses or reinforces terrain effects to create vulnerabilities in probable aggressor courses of action. Figure 2 visualizes how a commander might sketch and study terrain, defensive options, and consider possible variations to his plan for the maneuver defense mission.

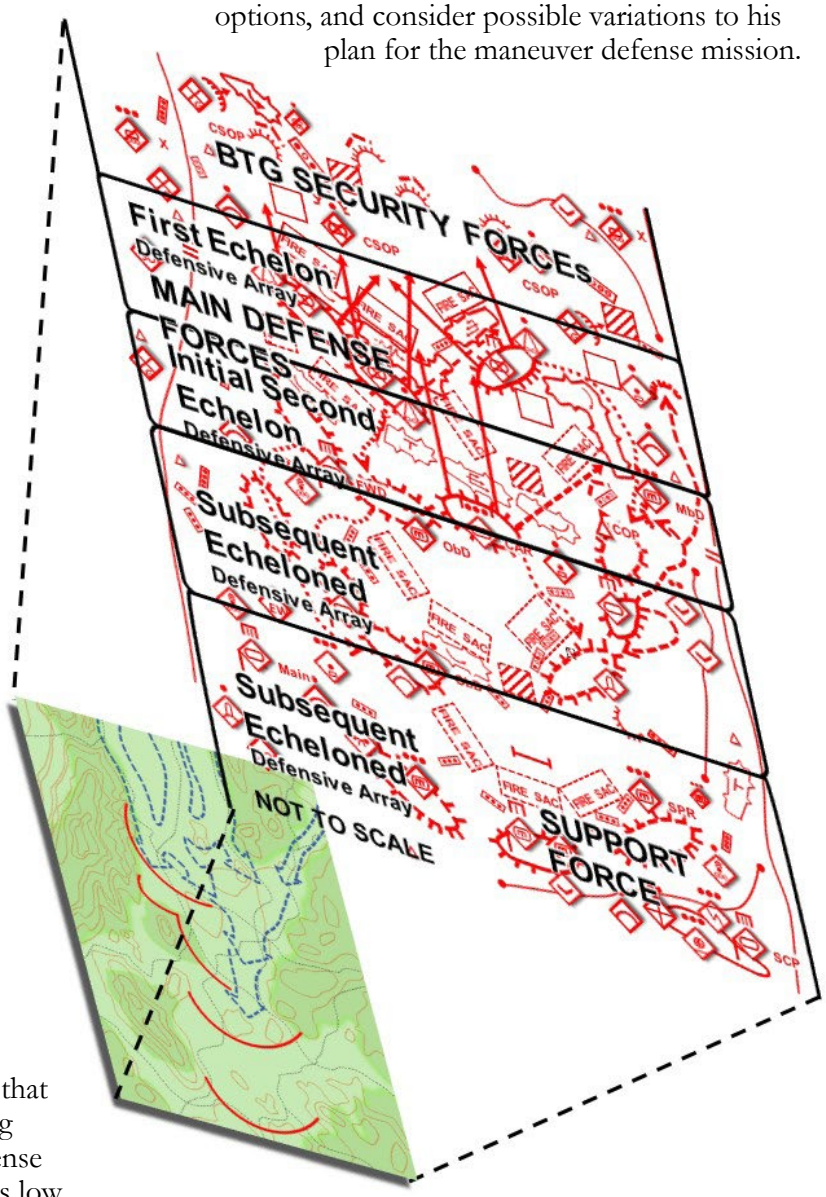


Figure 2. Commander's sketch: Conceiving Razvedka, fires, and maneuver actions of a maneuver defense

Source: TRADOC G-2 OE&TA. "Commander's sketch: Conceiving Razvedka, fires, and maneuver actions for a maneuver defense." TRADOC G-2 Operational Environment & Threat Analysis (OE&TA) Directorate. 2019.

Tactical Maneuver and Defensive Actions

The BTG commander uses the full depth of his defensive zone in a maneuver defense to strike the aggressor forces at planned locations and times with fires and maneuver to defeat the aggressor. Once combat is initiated, the timing of engagements is normally continuous on the aggressor combat systems but can be applied in a deliberate tempo to shape aggressor maneuver and direction for its ultimate destruction in zone. The type of munition, such as cluster bomblet, chemical agent, or thermobaric munitions are combat multipliers used to disrupt, defeat, or destroy targets or impede trafficability of an attacking force.[34] As indirect and direct fires degrade the aggressor's combat systems, obstacle complexes, deception, and obscurants further reduce the aggressor's critical assets.

The SV concept of "maneuver by fire" indicates the commander can choose to accept a degree of artillery survivability risk when identifying an aggressor high value target. The commander may direct indirect fire missions by massed artillery fires from subunits within effective range onto a single key target to rapidly destroy the target capability. The risk involves continuing to fire from a particular weapon system without shifting firing position until the fires destroy the designated target.[35] Area coverage REB complexes suppress the ability of aggressor counter-artillery radars to detect and proximity fuse munitions to strike artillery groupings during the maneuver defense.[36]

Support from operational echelon assets extend the defensive depth and conduct deception actions to lure the aggressor force on to terrain that ensures commitment into an axis/corridor of the SV brigade's zone. The maneuver defense in the BTG zone presents a succession of combat positions (*боевую позицию*), battle position complexes, or strongpoints (*Опорный пункт*) to channel the aggressor with disruptive or destructive fires and obstacles into *fire sacs*, and create conditions for BTG maneuver and continued fires effects. The BTG commander conducts engagements with a flexible repositioning of BTG elements among battle positions that withdraw under pressure to subsequent battle positions (BPs) into the depth of the zone. This maneuvering can be combined with counterattacks and additional fires. Tactical grouping or positioning of artillery considers the value of artillery and mortar direct fire positions within a defense, as well as the risks and advantage of firing positions well forward in a defensive array that are responsive and accurate with direct observation to adjust fires.[37]

The SV plan directs the conditions for displacement of forces to alternate positions, delay in zone when directed, and/or holding specific terrain to steer aggressor forces into subsequent *fire sacs* in the defensive depth of the zone. Strongpoints are a significant commitment of resources and are usually constructed as a battle position that the BTG expects to retain. Defensive preparations support strongpoints with deliberate and hasty minefields as well as wire, antitank, and other physical obstacles. SV artillery forces use artillery-delivered mines to seal any breaches in laid minefields as well as providing timed minefields to block or trap aggressor units.[38] Defending a strongpoint is a deliberate decision that forces the aggressor to commit combat power, slow or stop the pace or tempo of aggressor maneuver, and/or cause a directional change in aggressor attack efforts.

Survivability measures for battle positions and strongpoints are conducted in priorities of engineer effort and support that typically initiate actions in primary BPs in the first and second echelon of initial main defensive positions, and progressively prepare other BPs or strongpoint defenses in depth. Engineer effort is also apportioned to tasks in the security zone. All BTG units continue to improve survivability as forms of cover, concealment, camouflage, and deception (C3D) measures.

Natural maneuver restrictions of terrain, and the impacts of weather conditions, are reinforced in prepared defensive measures with general engineering effort and manmade obstacle complexes. These countermobility efforts also consider the mobility requirements of the defense in order to accommodate planned mobility corridors for rapid defensive repositioning, or counterattacks and contingencies that may require rapid maneuver of the BTG reserve.

Reserve

The maneuver reserve (*резерв*) is typically a force strong enough to defeat an anticipated aggressor exploiting force. The commander positions the reserve in an assembly area using camouflage, cover, concealment and deception to protect it from surveillance and attack. The BTG commander plans for and rehearses actions of a reserve along avenues of attack that may be required in response to emergent tactical conditions. Rapid maneuver may be required to occupy a *line of commitment* to engage aggressor forces, conduct a situational defense focused on a designated *fire sac*, or counterattack (*контр-атака*). A reserve typically has air defense coverage and mobility assets to facilitate its maneuver.

Motorized rifle units in strongpoints or in urban terrain that dismount soldiers from their BTRs, BMPs or MT-LBs may form an armored maneuver force labeled a bronegruppa (*бронетанковая группа*).[39] This group may

provide the strongpoint with armored mobile fires or the commander may position it on a flank of the likely aggressor attack as a mobile reserve.

Logistics

Logistics support in the SV is commonly referred to as material technical operations (MTO). The BTG task organization will include support from a MTO platoon assigned to provide the functional capabilities of maintenance, transportation, medical, and general support and selective services.[40] As part of the New Generation reforms the SV maneuver brigade receives support from a MTO battalion that pushes support forward to maneuver forces based on the commander's plan. Combat support and combat service support capabilities are provided from brigade to augment the BTG when additional units form the combat power maneuver and fires capabilities of BTG task organization. The MTO battalion at brigade consists of motor transport companies for general cargo, ammunition, and petroleum, oil, and lubricants (POL), a maintenance company, and other support or service support company or platoon units. The BTG, with one tank company attached, requires the maintenance, ammunition, and fuel augmentation to sustain subunits not in the motorized rifle battalion force structure. Other combat support forces operating with the BTG or in the BTG defensive zone coordinate logistics support depending on the command and support relationships to the BTG.

The employment and positioning of MTO assets are determined by the BTG senior logistics officer in conjunction with the BTG chief of staff and in support of the BTG commander's mission and the brigade defensive concept. During a maneuver defense, designated logistic support teams operate with and near first echelon and second echelon units of the BTG. Logistics are stockpiled or pre-positioned in echeloned defensive positions. Supply dumps are established for stay-behind forces in position or sites planned for repositioning as BTG fires and maneuver forces progressively reposition to defenses into the depth of the BTG defensive area.

Designated logistic support teams remain mobile to provide immediate resupply of ammunition and fuel and other classes of supply or services well forward in the defensive area. This mobility improves responsive relocation to designated rearm and refuel points in the succession of key defensive positions or defensive arrays. After conducting resupply forward at special resupply points, a reverse flow occurs to evacuate casualties and equipment requiring maintenance repair.

Logistic sites designated for tactical reorganization actions perform weapon system repair or replacement, limited personnel replacement, and other supply and service functions to restore BTG combat effectiveness within its available logistics means. Repaired equipment with crew replacements returns to designated units to continue the defense. Logistics is a cycle of continuous combat service support.

US Army Techniques Publication (ATP) 7-100.3, *Russian Tactics*, in Development

Mission. TRADOC G-2 ACE Threats Integration develops, authors, and publishes Army Techniques Publications (ATPs) on *Russian Tactics*, *North Korean Tactics*, and *Chinese Tactics* IAW program directives approved by US Army Combined Arms Doctrine Directorate (CADD).

Intent. Each ATP enhances a **doctrinal understanding and visualization** of threat tactical capabilities and limitations for use as ***conditions*** in the operational and institutional US Army for improved readiness.

ATP Concept. Each ATP presents **concepts, tactics, tactical models**, terms, definitions, military symbols, and observations or lessons learned from recent and current military operations in complex operational environments. Each ATP provides a **US Army authoritative description and fully unclassified non-prescriptive presentation** of ways and methods that a particular threat can plan, prepare, and execute missions, functions, and tasks.

Approach: The Russian Tactics ATP views Russian Ground Forces (SV) as a threat and potential enemy. As such, the view of unit and subunit actions is combat power seeking to negate any US or NATO overmatch or matching capabilities in order to neutralize and defeat those forces. If possible, the engagement seeks to avoid direct combat, but if necessary, all actions are predicated on aggressive, intense, and ferocious combat to overwhelm the aggressor force.

Employing Tactics in Maneuver Defense

In part two of this series, a battalion tactical group (BTG) conducts a maneuver defense to defeat an attack in zone by a US Armored Brigade Combat Team (ABCT). The BTG is a supporting effort to a motorized (mechanized) rifle brigade's first echelon of defenses and has been assigned a defensive zone with the frontage and depth to facilitate a maneuver defense. In this vignette, three motorized (mechanized) rifle companies, a tank company, and multiple support units are task-organized under command and control of a motorized (mechanized) rifle battalion headquarters.

This maneuver defense describes and illustrates the effective conduct of a series of engagements as the BTG withdraws into the depth of its defensive zone. Once the aggressor fully commits to the canalized terrain corridor, the BTG stalls the attack, cripples effective C2, and significantly degrades effective sustainment of the attacking forces. The result is that the aggressor attack

culminates before achieving its tactical objective. The SV commander accomplishes his mission to defeat a larger aggressor force within his brigade commander's intent and in support of the brigade defensive mission.

Look for "Maneuver Defense: A Tactical Fight to Victory." in a future issue of *Red Diamond.*

TRADOC G-2 Notes

- Maneuver Defense: Battalion Tactical Group. The illustrations and descriptions of this article spotlight tactical actions of mission execution but is not intended to be a comprehensive address of all actions and forces in a maneuver defense by a BTG or similar task-organized unit. Operations at the operational level support the tactical actions of the brigade and its BTGs.
- UAV is the title given to platforms used by adversaries of the US. When these platforms are used by US, allied, and friendly forces, even in training, they are referred to as unmanned aircraft systems (UAS). The term "unmanned aircraft (UA)" is used either to denote neutral platforms or to reference all platforms, whether friendly, neutral, or hostile.
- Russian ground forces use various titles in task-organized company, battalion, and brigade size units. The term *detachment* can be applicable to any of these Russian units and subunits. In this article, detachment in used for a task-organized company with the acronym CDET. Other BTG elements, such as an obstacle detachment or a mobility detachment, are typically task-organized platoon-size elements.
- TRADOC G-2 Operational Environment and Threat Assessment Directorate is conducting a final review of TRADOC G-2 Handbook 1.10, *Threat Tactical Actions-Drills*, (2019) that provides multiple threat vignette narrative and illustration examples of threat tactical tasks and drills. Use and can be tailored for opposing forces (OPFOR) in readiness training or adapted to mission preparations against identified adversaries or enemies. ◆

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The SU-57

Challenges and Changes for Russia in a Multi-Polar World

By **Bradley A. Marvel,** OE&TA

The Russian experience in the Great Patriotic War continues to cast a huge shadow over Russian military thinking, influencing everything from tactics to procurement decisions to national strategy and policy. At the same time, the contemporary Russian government is still trying to find its way in a post-Soviet world: no immediate perceived existential threat, smaller and wildly varying defense budgets, and no captive audience for foreign military sales (FMS) are proving a challenging series of circumstances for the Russian defense industry.

The Su-57 program represents one of the highest-profile confluences of Russian military thinking so deeply influenced by the Second World War with the realities of the 21st century defense landscape. The older Soviet approach to procurement – fielding large numbers of reliable-though-unsophisticated systems over smaller numbers of high-tech systems – clashed head-on with the fiscal, political, and tactical realities of developing a 5th-generation multirole combat aircraft.

Shaping the Russian Way – The Eastern Front and the Cold War

Despite the widespread destruction and economic setbacks of the Russian Civil War and the early days of communist rule, the Soviet aircraft industry was one of the world's most advanced in the 1920s and early 1930s.[1] Soviet officials saw the burgeoning world of aviation competition as one of the best ways to display Soviet ingenuity, technical advancements, and personal heroism, and as a result, poured money into aviation-related causes. Soviet planes and pilots broke numerous records and enjoyed several highly successful public demonstrations, capped off by the world's first transpolar flight in 1937. Soviet aircraft design bureaus pushed out several world-beating combat aircraft, led by the stellar Polikarpov I-16 fighter and Tupolev SB light bomber. While most of the Soviet military was still in a state of some disarray in the 1930s, the Soviet Air Services – colloquially known as the VVS – were among the world's very best.[2]

The ANT-25 broke numerous aviation records in the 1930s, including the world's first transpolar flight. Soviet aviation in this era led the world in many key aspects of aircraft design and operation.
Source: SDASM Archives [Public domain] https://commons.wikimedia.org/wiki/File:Tupolev,_ANT-25.jpg

The specter of war was looming over Europe by the late 1930s. Every major nation had begun rebuilding their militaries, set to deal with the new threat of fascism and the aggressive foreign policies of newly-rearmed Germany. Despite this volatile environment, Josef Stalin, in one of history's most baffling decisions, ordered an unprecedented series of purges that targeted practically every element of Soviet society. Two of his main targets were the Red Army and aircraft design bureaus. The Red Army – and its air force – lost many of their experienced officers, and Soviet aircraft design bureaus lost many of their most capable engineers. Most prominently, the brilliant and famed Andrei Tupolev, designer of several leading Soviet aircraft, was imprisoned and charged with sabotage and espionage. The Soviet aircraft industry fell apart practically overnight, and the VVS found itself surpassed in capability by virtually all its competitors in a matter of a few short years.[3] Unfortunately for the Soviet Union, they found themselves embroiled in the largest and most destructive conflict in history before they were able to fully recover.

When Germany invaded the Soviet Union in the summer of 1941, the VVS looked, on paper, as though it should post a significant challenge to the German

Luftwaffe. The VVS significantly outnumbered the Luftwaffe both in total aircraft and combat aircraft, the latter by a nearly 2:1 margin (approximately 4,000 to 2,000).[4] The Germans were fighting an offensive battle, and relatively few airfields from which to conduct their operations. Germany, however, achieved almost complete surprise over the VVS, destroying thousands of aircraft before they could even get off the ground. Even when they successfully engaged the Luftwaffe, German pilots were better trained and more experienced than their Soviet counterparts, and German aircraft were superior virtually across the board. Some 4,000 Soviet planes were destroyed in the first week of the campaign, and the VVS virtually ceased to exist as a fighting organization. Luftwaffe losses stood at less than 100 aircraft. This week of fighting remains one of the most one-sided and destructive air battles ever fought.[5]

The Bf-109 (bottom) and Ju-87 were the Luftwaffe's frontline fighter and attack aircraft respectively in 1941. These types dominated the air war against the VVS in the early days of Operation Barbarossa.
Source: Billhardt / CC-BY-SA 3.0 https://ru.m.wikipedia.org/wiki/Файл:Bundesarchiv_Bild_101I-429-0646-31,_Messerschmitt_Me_109_und_Junkers_Ju_87.jpg

The Soviets reeled from the German assault throughout the summer and fall of 1941. Luftwaffe attacks against Soviet ground forces and rear area targets were relentless and well-coordinated with ground assaults. Remaining VVS aircraft were either destroyed or forced out of the combat area, giving the Luftwaffe complete command of the air. Limited VVS counterattacks against German ground forces were suicidally ineffective.[6] This experience – the complete loss of control of the air, and the inability to meaningfully resist – was almost plagued the Red Army through first couple of years of the war. Though the VVS would eventually re-assert itself as a fighting force, the multiple generations of Soviet officers who served in the early days of the Great Patriotic War – from field marshals to newly dressed lieutenants – had their perspectives on combat colored by the days when Soviet airspace did not belong to the Soviets. From that point on, air defense of the homeland would be one of the Soviet Union's – and eventually Russia's – highest priorities.

The Yak-3 was the best Soviet fighter of the war, and arguably the best low-altitude air superiority aircraft fielded by any combatant during the war.
Source: Oren Rozen [CC BY-SA 3.0 (https://creativecommons.org/licenses/by-sa/3.0)] https://commons.wikimedia.org/wiki/File:CF15_Yak-3_ZK-YYY_040415_03.jpg

The Great Patriotic War shaped Soviet military thinking in other ways as well. The acute need for new and better fighter and attack aircraft, the vast expanse of the Eastern Front, a huge lack of qualified pilots and mechanics, and the relatively primitive capabilities of newly-built Soviet factories necessitated the building of huge numbers of simple, reliable, easily maintained, and easily operated aircraft. The nature of combat on the Eastern Front – largely driven by the ferocity of the ground fighting and the limitations of Soviet aircraft design – centered on short-range, low-altitude combat, with large groups of attack aircraft supporting army operations while fighters attempted to win at least temporary air superiority over the battlefield.[7] The Soviet aircraft industry responded brilliantly to the needs of the Red Army, producing a series of fighters and attack aircraft that were perfectly suited to the needs of the VVS. Indeed, by 1944, the frontline fighters of the VVS – the Yak-3, Yak-9, and the La-5 – were decisively superior to most of their Luftwaffe competition at low altitude.[8] These fighters were small, simple to build and robust, but were still splendid performers. Slowly, and at great cost, control of the air was wrested from the Luftwaffe, a critical element of of throwing back the German army and winning the Great Patriotic War.

The Soviet Model in the Jet Age

Despite their triumphs on the Eastern Front, by the end of the Second World War, the VVS once again found itself on their back foot, technologically speaking. Western air forces had invested heavily in jet engines and strategic bombers during the war, and in the early days of the nuclear age, these two technologies were of critical importance. To help close this gap, the Soviets added new techniques to their capability development portfolio – industrial espionage and diplomacy. Soviet bomber technology was brought up-to-date by copying the American B-29 virtually rivet-for-rivet,[9] while careful diplomacy mixed with outright industrial theft brought the VVS the UK's most sophisticated jet engine in 1947.[10]

Soviet thinking throughout the Cold War was not – as is so often depicted in the West – obsessed with the idea of conquest and implementation of communist rule in Western Europe. Instead, the Soviets saw themselves as being surrounded by potentially hostile powers.[11] The Soviets had no desire to repeat the horrific destruction of the Great Patriotic War, and planned instead to resist any Western aggression outside of Soviet borders. This necessitated developing a series of buffer states in Eastern Europe, all nominally communist and beholden to Moscow in varying degrees. The Warsaw Pact, as this alliance came to be known, provided the final major element for the Soviet capability development model: foreign military sales. With all of the Warsaw Pact nations essentially cut off from Western military technology, the Soviets found willing (and sometimes unwilling) markets for virtually all of their military hardware. In addition to funding large chunks of the Soviet military budget, FMS ensured a degree of standardization in equipment and tactics throughout the Warsaw Pact armies.[12]

The VVS envisioned the "World War III" scenario with the West as very similar to what they experienced in 1941-45. Nuclear weapons would be exchanged, with Soviet aircraft and missiles called on to defend Soviet airspace against long-ranged bombers. Eventually, a massive ground war would take place in Eastern or Central Europe, a clash between two mechanized armies on a devastated landscape.[13] Air power would be a key enabler for this battle, air power required air superiority. Airfields, however, would be among the first things targeted for destruction by the larger and more powerful Western air forces. Thus, Soviet aircraft had to be simple to operate, robust, easy to maintain, and numerous. They had to perform well, but did not need to be able to fly long distances, carry heavy loads, or be equipped with the latest in avionics.[14]

The MiG-15 provided a nasty surprise to UN forces in Korea. The design's performance, however, was only made possible by a British engine design.
Source: Tibboh [CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0)] https://commons.wikimedia.org/wiki/File:Mikoyan_Gurevich_MiG-15_UTI.jpg

The various elements of the Soviet model were employed in every generation of Soviet fighter aircraft, from the 1950's through the new millennium. Simplicity and reliability were the most important characteristics, followed closely by performance in the aircraft's intended role. Long range and advanced avionics were generally not prioritized. The primary missions of the VVS were defending Soviet airspace and supporting a potential ground war in Eastern Europe; thus, two main fighter types were employed: air superiority aircraft, typically designed to win close-range dogfights, and interceptors, designed to engage Western bombers at high speed and long distances.[15] Where possible, Western technology was reverse-engineered and integrated into new designs; a prominent example of this was the adaptation of the American AIM-9 short-range air-to-air missile into the Soviet K-13.[16] Each new generation of Soviet fighter was produced in large numbers for both VVS use and the export market, with massive export sales helping to fund each subsequent upgrade cycle. The Soviets found huge export markets not only in their client states, but also outside the US-USSR axis: Middle East, Far East, and African militaries all lined up to buy Soviet hardware, which was generally cheaper and easier to maintain than their Western equivalents.[17]

This process produced some impressive results. The MiG-15, on showing up in the Korean theater, proved itself better than any Allied fighter in existence, save the brand-new F-86, which was rushed to the theater to counter the MiG. In Vietnam, the MiG-21 asserted itself as a dangerous opponent against the very

advanced and expensive F-4 Phantoms of the US Navy and Air Force. The MiG-29, examined after the fall of the Iron Curtain, was assessed as a highly capable air superiority fighter, possessing a handful of capabilities unmatched by its contemporary Western competitors. Its bigger and more expensive brother, the Su-27, was even more capable. There were some failures as well: despite its impressive specifications, the MiG-25 was an operational nightmare that never proved its utility, though misassesment of the design by Western intelligence services was enough to set off a minor panic.

In short, the approach used by the Soviet Union throughout the Cold War enabled them to keep pace with – and occasionally surpass – Western militaries who generally enjoyed better technology and more resources.

The Post-Cold War Environment and the New Russian Aerospace Industry

When the Soviet Union collapsed in 1991, huge changes followed for the Russian military. Decades of direct competition gave way to a new age of limited cooperation with the West, largely eliminating the constant menace of a huge, existential war, leading to a near-immediate drawdown of military size and strength in both Russia and NATO. The old Soviet client states quickly aligned themselves with NATO and the West, robbing Russia of both its longtime "buffer zone" and a captive market for FMS. Globally, the dissolution of the old US-USSR axis created a vacuum into which new powers could assert themselves, with a resurgent China leading the way. Virtually overnight, the Russian military was dismantled, as old Soviet states went their separate ways and the Russian government sought a new identity for itself. Years of reform attempts failed or fizzled, the Russian economy tanked, and the Russian military industry faced collapse.[18] Military spending was cut by over 80%; the resulting weaknesses of the post-Soviet Russian military were put on full display during operations in Chechnya and Georgia.[19]

The S-400 surface-to-air missile system is one of the highest profile and most successful post-reform Russian defense programs.
Source: Original uploader and photographer was UMNICK at ru.wikipedia [Public domain] https://commons.wikimedia.org/wiki/File:S-400_Triumf_SAM.png

It wasn't until 2008 that a major modernization and reform effort finally took hold. Huge legacy formations were abandoned and professionalization was prioritized, which resulted in a mammoth drawdown of strength. The old Soviet approach which emphasized mass and numerical superiority gave way to a much leaner and agile force, consisting of better trained professional soldiers and better quality equipment. The new VVS scrapped thousands of aging airframes and abandoned hundreds of run-down bases, consolidating their strength in smaller units and far fewer command organizations. Importantly, Russian Air Defence Forces, a longtime branch unto themselves, were integrated into the new VVS.[20]

The end of the Cold War had huge effects on military technology development worldwide. For over a half-century, NATO and Warsaw Pact forces were locked in a constant contest for technological superiority, backed by relatively huge defense budgets and enabled by a simple, single opponent operational environment. The post-Cold War operational environment proved to be far more complex. Counter-terrorism and counterinsurgency operations became far more commonplace; the threat set faced by both US and Russian militaries broadened significantly. Smaller force structures and smaller budgets placed greater strains on military industry, and commanders at all echelons struggled with far more limited training resources. For both NATO and Russian air forces, the idea of a massive air battle over the nuclear wasteland of WWIII was replaced by the reality of small scale, precision raids against primitive opponents, though these missions competed with an ongoing need to keep pace with peer opponents. The pace of aircraft development slowed to a crawl, and a generation of fighter development essentially dissolved. Legacy Soviet aircraft were not only ill-adapted for the new operational environment; they were also very poorly maintained and dangerous to their crews. The enormous drawdown that began in 2008, however, freed up some resources to fund a modernization effort. The Russian aerospace industry had been subsisting almost entirely on exporting upgrade variants of legacy fighters to the handful of export customers that remained – primarily India and China.

Two major changes occurred in the political environment right about the time Russian military reforms were taking place. First, the Russian economy enjoyed a period of impressive recovery, aided primarily by high oil prices and a massive expansion of the Russian petrochemical industry. Second, Russian relations with the West – particularly the United States – worsened significantly.[21] Tensions over missile defense, the Russia-Georgian War, the Ukraine, and the Middle East gave rise to a new Cold War dynamic. Both Russia and NATO began to reassess their military needs in light of these new tensions, with both sides reconsidering the possibility of a ground conflict taking place in or around Russia's border regions. The long-neglected VVS and Russian aerospace industries suddenly found themselves not only with far more resources, but with a much more challenging mission set – one reminiscent of that which the WWII VVS had faced 60 years before.

Into the Fifth Generation – A Complex Technological and Political Problem

This so-called "5th-generation" of combat jet aircraft is simply the latest iteration of combat aircraft design. Previous generations are broken down roughly in Table 1.

5th-generation aircraft are defined primarily by four main features:

- Low observable (LO) technology for both radar and infrared (IR) signatures
- Advanced sensor suites highlighted by actively scanned radar arrays
- Data networking and track sharing, with potential shared engagement capability
- Supermanuverability and great efficiency at speed

Development of 5th-generation aircraft is an enormous project, comparable in many ways to the development of battleship fleets or heavy armored cavalry of generations past. Competitive 5th-gen aircraft require, at a minimum, sophisticated aerodynamics and avionics, an advanced understanding of low-observable (LO) technology, a cutting-edge jet engine design, and extensive over-the-air data sharing capability. Only three nations have completed the development phase of 5th-gen fighter programs: the United States, China, and Russia. India – as we shall see – may soon be a fourth.

The F-22 was the world's first 5th-generation fighter aircraft, and remains the world's premier air superiority platform 15 years after its introduction.
Source: Master Sgt. Andy Dunaway [Public domain] https://commons.wikimedia.org/wiki/File:F-22_Raptor.JPG

Fighter aircraft have gradually gotten more and more expensive over time. A WWII-era P-51 Mustang cost around $600,000 in 2019 dollars. Its successor, the F-86 Sabre, cost around $2.1 million. The twin engines, advanced avionics, and enormous size drove the cost of the Vietnam-era F-4 Phantom to nearly 10 times that

Table 1. Breakdown of pre-5th generation combat jet aircraft

Generation	Era	Armament	Speed	Features	Examples
1st	WWII-era and immediate post-war	Guns only	Subsonic	Search-only on-board radars, limited range, poor reliability	Me-262, P-80, MiG-9
2nd	Korean War-era and early Cold War	Guns and air-to-air rockets, primitive air-to-air missiles	Transonic	Primitive fire control radars, swept wings, powered control surfaces	F-86, MiG-15, Hawker Hunter
3rd	Vietnam War-era and mid Cold War	Guns, semi-active radar and infrared air-to-air missiles	Supersonic	Multirole, fire control radars, afterburners	F-4, MiG-21, MiG-23
4th	Post-Vietnam, late Cold War	Long-range missiles, semi-active and active radar missiles, heavy missile loadouts	Supersonic	Advanced radars, onboard software, powerful engines, multirole configurations	F-14, F-15, F-16, MiG-29, Su-27
4.5th	Post-Cold War	Guns, advanced missile technology (off-bore, active radar)	Supersonic	Actively scanned radars, thrust vectoring, primitive low-observable technologies	Su-30, F/A-18E, Eurofighter Typhoon

of the F-86: $19 million. The F-4's direct successor, the F-15 Eagle, cost twice what the Phantom did. The F-22 – the world's first 5th generation fighter – took the per-airframe cost into orbit. At nearly $180 million per copy, the F-22 is 300 times more expensive than the P-51. If this trend continues, the United States Air Force of the year 2120 will consist of only one plane, which will cost more than the US GDP. While this is obviously unlikely to occur, it illustrates one of the major problems facing modern aircraft designers: balancing cost and capability within programs that take decades to bear fruit.

The Su-57 Takes Shape

The Russian 5th-gen program that would become the Su-57 began at almost the same time as the American "Advanced Tactical Fighter" program that would eventually give birth to the F-22. By the late 1970s, both the US and USSR were considering the replacement for their current frontline fighters: the F-15 and F-16 for the US, and the MiG-29 and Su-27 for the Soviets. Both nations identified new technologies such as LO, thrust vectoring as the centerpieces of the new design, and both nations threw significant resources into the requirements development and prototyping phase of the new programs.[22] When both were still gestational, however, the defense landscape – and much of the rest of the world – changed dramatically. The Soviet Union collapsed, the Cold War ended, and with it, much of the perceived need for high performance fighter aircraft.[23] The F-22 made it to production despite a long and troubled development process only to have its production run massively reduced; the Russian 5th-gen designs were all shelved. Development of the F-22 and upgrades to Western 4th-generation aircraft, however, eventually prompted Russia to revive its interest in a 5th-gen fighter. Sukhoi had, by this time, largely supplanted Mikoyan-Gurevich as the premier Russian fighter manufacturer; it was they who received the contract to develop the PAK-FA, the predecessor to the Su-57.[24]

The first PAK FA prototype conducts a test flight. Early prototypes had minimal onboard systems and engines taken from the Su-27 family of aircraft.

Source: Vitaly V. Kuzmin [CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0)] https://commons.wikimedia.org/wiki/File:T-50_PAK_FA_-_MAKS-2013Firstpixflights03.jpg

The demands of developing the Su-57 forced major changes to the long-time and very successful Soviet method of aircraft design. It simply isn't possible to build a system with 5th-gen capabilities cheaply, nor is it possible to make them simple or easy to maintain. This also meant the old Soviet approach of mass FMS sales could no longer be used: a potential Su-57 customer would be making an enormous investment and would thus demand ongoing partnership and support as a part of any deal. Russia couldn't simply sell large numbers of cheap, simple aircraft to a customer and then essentially forget about the transaction: a sale of this size would more closely resemble what businesspeople call "relationship marketing." At the same time, Russia was desperate for a partner to help offset the ruinous cost of development – constant delays, technological unreadiness, and corruption issues were all piling up in the face of the new flagship fighter.

Russia found no interest in a simple export agreement among their traditional customers; costs were either far too high, the new fighter technology too uncertain, or, in the case of China, already surpassed by domestic programs. Russia instead had to offer partnership in the program – something that had never been done before. The US adopted a similar approach with the mammoth F-35 program; offering allies and customers a partnership in the development process. This helped to dissipate the risk of the program, aided interoperability, and perhaps most importantly, enabled a kind of political engineering that made the program virtually un-killable. Though a few F-35 customers would reduce their purchases, none of the 10 major partners withdrew or canceled their orders despite hideous time and cost overruns – although Canada may eventually withdraw, pending an ongoing competition, and Turkey was booted from the program following their purchase of Russian S-400 surface-to-air missiles.[25] Russia found the market for the Su-57 much tighter – nearly every country that could afford a 5th-gen fighter had either signed on for the F-35 or didn't have requirements for a frontline fighter aircraft. The one exception was India: their defense budget was robust and growing, their air force needed modernizing, and they had a long and lucrative history purchasing Russian aircraft. Russia began viewing India as a possible savior for their troubled fighter, and offered an unprecedented partnership deal to the Indian Air Force. [26]

India as a Partner: Savvy, or Gullible?

Russia had never before developed a major weapons system in a partnership arrangement; the vast quantities of tanks, guns, and planes they'd exported over the years were all simple FMS deals, mostly with their

client states. Following the success of the BrahMos cruise missile project – a joint venture between Russian industry and the Indian military – both sides were enthusiastic about an agreement for the PAK FA.[27] The initial deal, agreed to in 2007, granted India a full half share of the project in exchange for a roughly $6 billion investment, with delivery of over 200 aircraft to begin in 2017. India's major aircraft manufacturer – Hindustan Aeronautics Limited, or HAL – would have full production rights once the aircraft reached maturity, with the Indian aircraft to be called the FGFA: Fifth Generation Fighter Aircraft.[28] The total production run between the Russian and Indian air forces was estimated at some 500 aircraft, with traditional FMS customers pushing the total production past 1,000 aircraft. A production run of this size rivaled that of the F-35, and the total cost of a program of this magnitude would have funded virtually the entire program and made Sukhoi one of the world's largest and wealthiest defense firms.

A pair of early-production Su-57s in formation. Su-57 flights have been commonplace at airshows and defense exhibitions since the type began flying, ostensibly to build interest in the type from possible foreign customers as well as to demonstrate the technology to potential competitors.
Source: Anna Zvereva from Tallinn, Estonia [CC BY-SA 2.0 (https://creativecommons.org/licenses/by-sa/2.0)] https://commons.wikimedia.org/wiki/File:Russian_Air_Force,_052,_054,_Sukhoi_Su-57_(36975276060).jpg

Almost immediately, cracks began appearing in the plan. The initial design took an extra year to complete, but was approved in mid-2009. The initial flight of the prototype was also pushed back a full year; when the initial prototypes did fly, they were essentially "hollow" airframes that had no onboard systems aside from basic flight. Prototypes were plagued by engine problems, stability problems, and weapons integration problems, culminating with an airframe loss due to an engine fire in 2014.[29] The engines were particularly problematic – Russian engine design had long lagged behind the US and UK, and the demands of the 5th-gen aircraft proved too much for existing Russian technology. Russian designers were not strangers to engine issues – poor reliability and wild variance in performance were constant challenges going back to the very first Soviet jet fighters. The new partnership dynamic, however, made the issues facing the PAK FA far more acute than those experienced by previous generations of Russian and Soviet aircraft designers. India began publically voicing concerns about the status of the program as early as 2011; by 2013, the complaints had become near-constant. The prototypes did not appear to be delivering on promised reliability, LO features, and safety, and India's investment gradually became more and more precarious as they became increasingly concerned.[30]

Russia hadn't faced a problem like this before. Their previous export agreements were essentially underpinned by a *caveat emptor* arrangement with their customers; customer dissatisfaction was either completely ignored or papered over. Now, the survival of Russia's 5th-gen program was heavily dependent on making the Indians happy. In an unprecedented display of honesty, Russia publically admitted to the massive delays and cost overruns and promised to improve the results of the program rapidly and cheaply.[31] Unlike Russia's defense industry, India's defense ministry was answerable to a democratically elected body, who began loudly voicing their concerns about where these billions of dollars had gone. India and Russia responded by renegotiating their partnership, with India lowering their investment by a billion dollars and buying proportionally fewer airframes –144, down from the original 200+. Russia was also forced to reduce its commitment to the PAK FA, cutting its buy from 300+, down to around 150, and then to ~70 airframes between 2012 and 2016.[32] This reduction caused the per-unit cost to skyrocket in much the same way the B-2's and F-22's cost had when their production runs were cut short, which caused something of a panic in Russia. The PAK FA – now officially called the Su-57 – was now no longer the cheap alternative…any nation that chose to invest in the Su-57 would have to shell out hundreds of millions of dollars.

The Russian response to these changes was bizarre. Instead of attempting to mend fences with their Indian partners, they presented them with a bill – a huge bill. Claiming that they were "selling" valuable technology licenses as a part of the partnership, Russia demanded a staggering $7 billion from India in order to maintain their stake in the Su-57/FGFA program.[33] India's response was predictable. They didn't even bother to negotiate – they withdrew almost immediately. Just like that, Russia's first major defense partnership agreement was dead, and the Su-57 program itself was on life support. Though India still claims to have an interest in buying advanced Russian aircraft, the sting of the billions of dollars lost on the failed FGFA partnership,

coupled with a viable domestic 5th-generation fighter program (the AMCA) make the prospect of any future sales unlikely at best.

The Su-57 Enters Service, Sort Of

The big stick of Vladimir Putin intervened in the Su-57 debacle in 2016, "asking" Sukhoi to reduce their profit margins in order to lubricate the final purchases of serial Su-57s. They agreed, and the serial production of 70-odd aircraft began in the summer of 2019.[34] Contracts exist for only 15 production aircraft, however, and the possibility exists that production may be terminated after this first batch is delivered.

The Su-57 that went to production has some very impressive features. Full 3-dimensional thrust vectoring, an advanced actively scanned radar array, an advanced and capable suite of missiles (set to enjoy upgrades of their own in the near future) and exceptional maneuverability at combat speeds combine to make a very impressive set of specifications. The aircraft appears to have significant limitations as well – engine troubles are not yet behind it, with initial production variants equipped with an "interim" engine that delivers neither the performance nor the reliability that was initially specified.[35] The LO capability appears to only function from forward aspect angles and likely does not include IR signature suppression, a limitation easily detected by simple visual observation of the aircraft.[36] Datalink architecture is still primitive – a complaint lodged by the Indians all the way back in 2012.

The Chinese J-20 beat the Su-57 into service and features many of the same advanced technologies. It is one of the first times in the modern era that Chinese military technology equaled or surpassed that of Russia.

Source: emperornie https://www.flickr.com/photos/77326563@N06/ [CC BY-SA 2.0 (https://creativecommons.org/licenses/by-sa/2.0)] https://commons.wikimedia.org/wiki/File:J-20_fighter.jpg

These limitations, plus the limited (possibly very limited) production run implies that the Su-57 will not have anywhere near the impact on the VVS or the defense landscape in general that Russia envisioned back in 2007. Both China and India now have competing 5th-gen programs, with the Chinese J-20 beating the Su-57 into squadron service by several years while costing tens of millions less per airframe. The F-35, despite the years-long debacle that was its development and integration period, has commenced successful integration into active service. F-22s have been in frontline service for over a decade, and are now widely regarded as the gold-standard of air superiority aircraft despite their very limited numbers. In short, the Su-57's competition – both commercially and militarily – is intense, and the aircraft has yet to demonstrate any of its capabilities outside of carefully controlled test environments.

Despite the collapse of their initial agreement, Russia is still trying to sell the Su-57 to India. They face competition an Indian Air Force and political landscape jaded by the years-long development debacle, as well as a new Indian indigenous 5th-gen fighter design. Competitive FMS of this type has never been a strength of the Soviet/Russian defense industry, but the transition to competition in the modern, high-tech, multipolar world must occur if Russia intends to continue its long history of FMS. Development of soft power – salesmanship and cooperative diplomacy – must replace the old Soviet strongarm tactics, and high-tech, low-density systems must replace the old Soviet numbers-game approach.

Su-57 in Combat – Tactical Vignette

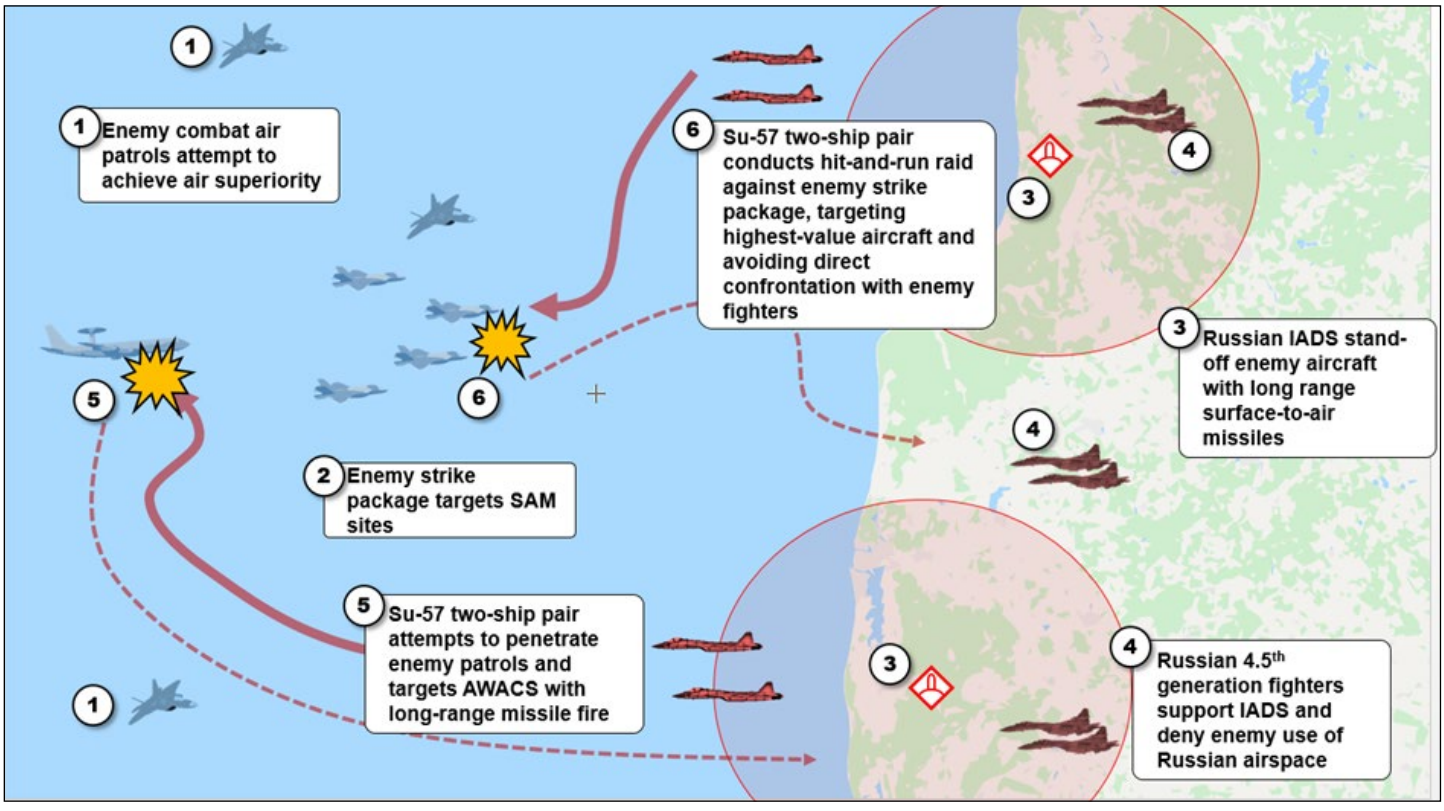
The capability limitations of the Su-57 coupled with the small numbers of available aircraft create a challenging situation for VVS tacticians. LO capability is practically a requirement for surviving the ultra-lethal environment

of air-to-air and surface-to-air missiles that will fill the skies in the initial phases of a current or future air war, but with only a handful of LO aircraft available, Russian commanders must be creative with their use. The primary mission of the Su-57 remains defending Russian airspace and achieving local air superiority – or at least parity – over tactical ground actions, much the same as it was for the VVS 70 years ago. Russian integrated air defense systems (IADS) bear a significant chunk of this mission; Russian investment in IADS over the last 3 decades has been enormous. Ground-based systems have limitations, however, and the VVS will be called upon to augment IADS capabilities.

In this scenario, Russia finds itself in combat against a modern, high-tech enemy that relies heavily on air power to support tactical ground operations. The mission of the VVS is to deny the enemy use of the air long enough for Russian Ground Forces (RGF) to achieve victory on the ground. Russian commanders assess that the enormous cost and prestige associated with enemy 5th-gen aircraft make them a center of gravity: shooting down even a small number of these systems represents a major political and tactical victory that can be exploited through information operations. At the same time, the VVS recognizes that the Su-57 is outclassed by the enemy's more advanced and more mature fighters, so will seek to avoid direct confrontation that could lead to defeat. Instead, small formations of Su-57s – likely only two aircraft per – target enemy strike packages, tankers, and AWACS aircraft using the front-aspect LO capabilities of the Su-57 to avoid enemy fighters. Once the Su-57s have engaged and destroyed some number of high-value enemy assets, the Su-57s will rapidly retreat to Russian-controlled airspace, where a combination IADS and 4.5th-generation aircraft pose a serious threat to even advanced enemy aircraft. Essentially, instead of attempting to win air superiority outright, VVS commanders will likely employ the Su-57 as a kind of aircraft sniper, asymmetrically targeting high-value assets, degrading enemy morale and combat capability while winning valuable information victories that can be exploited through propaganda.

Training Implications

The presence of the Su-57 – and any new follow-on Russian fighter aircraft – will likely never allow the VVS to achieve air superiority versus Western or other advanced air forces. The specialized capabilities of the Su-57, however, pose a significant threat to any force that attempts to impose itself on Russian airspace. VVS commanders will attempt to amplify the effects of their limited fighter force by achieving high-profile victories whose information value outweighs their military value. Effectively exploiting propaganda victories against the high-tech, casualty-averse enemy force is designed to compel enemy commanders into curtailing or withdrawing their air component, leaving enemy ground forces without much-needed air support. ◆



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Replicating Russian Disinformation & Deception in Training

Operational Environment Considerations

By **William Hardy,** OE&TA

Go Fish

In 1939, the Director of Naval Intelligence Admiral John Henry Godfrey of the Royal Navy issued a document that is now known as the Trout Memo.[i] In it, he likens military deception to the sport of trout fishing (i.e., fly fishing).

> *"The trout fisher casts patiently all day. He frequently changes his venue and his lures. If he has frightened a fish he may give the water a rest for half an hour, but his main endeavor, viz. to attract fish by something he sends out from his boat, is incessant."*

Though simple, this metaphor could not be more apt in its illustration of the inherent patience, ingenuity, and an enduring focus on a primary objective that are necessary requirements for successful information and influence operations.

Eight decades later, the patience and enduring focus described in the Trout Memo can be seen in recent Russian disinformation campaigns and their efforts to meddle in the domestic affairs of other nations. The Russian interference in the run-up, during, and after the 2016 US Presidential Election has become, perhaps, the most infamous and now widely investigated contemporary example of recent Russian deception and disinformation campaigns. This article pulls from the findings in the US Senate's Select Committee on Intelligence (US SSCI) Report on Russian Active Measures Campaigns and Interference in the 2016 US Election Volume 2: Russia's Use of Social Media with Additional Views, among other references. The intent of this piece is foster critical discussion concerning whether the US Army's training community can inform and develop an Operational Environment (OE) with enough depth and complexity to replicate how Russia has utilized information operations, disinformation, and deception.

Consistent Patterns of Activity

While the report contains many details that demand attention, one of the key findings is the assertion that while the Russians may be using new tools to

i. While the Trout Memo was issued under Admiral Godfrey's name, there is speculation that it was authored by his assistant, Lieutenant Commander Ian Fleming, who later went on to Author the James Bond novels.

conduct information operations, the underlying principles driving their efforts are the result of decades of application, study, and continued refinement of disinformation practices used inside of Russia, within its zone of periphery, and beyond. In some instances

> *"Nothing has changed [since the Soviet era], Russia is doing everything it can today to embarrass the US."*
>
> *— Sergey Tretyakov*
> *Former Russian Intelligence Official*

disinformation can be used for immediate purposes, as seen in the intentional spreading of claims of alleged atrocities committed by Georgians during the 2008 Russo-Georgian War to gain international legitimacy for their actions. While in others instances, Russian efforts might be better understood as being long term investments, which though initially small, have the potential to grow exponentially in the future.[1] While these principles are not new, Russia's military has embraced technological advances in order to amplify its efforts, creating an advantage in an otherwise asymmetric competition. As a testament to the underlying principles guiding the evolution of Russian efforts, they have stayed relevant and "even with the rise of new technologies, the underlying truth about such operations hasn't changed […] they [their methods] are less a way to conjure up something out of nothing than to stir a pot that is already bubbling."[2] In other words, the Russians are simply adapting and evolving proven methods rather than creating something new.

The US SSCI report makes it abundantly clear that the Russian military has seized upon the idea that "the manipulation of the information sphere is a very effective tool" for achieving desired outcomes and often times is a more economical alternative or augmentation to conventional operations.[3]

> *One way of looking at the impact of these activities... is to think of drops of water falling on a stone: five minutes, ten minutes, fifteen minutes, one hour, one day, nothing happens, but five years, ten years, fifteen years – you've worn a hole in the stone.*
>
> *— Dennis Kux*
> *Former Head of the US Active Measures Working Group, 1984*

Overwhelming the Audience

As part of their efforts to manipulate the information environment, the Russians seek create a **high volume of messages** originating from **multiple channels** (e.g., online information sources, social media platforms). By creating content that delivers their messages through "text, video, audio, and still imagery," the Russians are flood the targeted audience with disinformation.[4] The ubiquity of information and communications technology around the globe has dramatically increased both the number of people that can be exposed to a narrative and the number of messages about that narrative that can be delivered.[5]

Russian disinformation campaigns are also aided by the **speed** at which they are able to create and distribute content. The SSCI states that the Russians strive to develop, adapt, and distribute false narratives online at a pace that exceeds the truth.[6] The Russians intent is to force other actors to simultaneously disprove false narratives while they seek to support their own narrative. If the Russian disinformation is able to engage an audience first, then it will be more difficult for good-faith actors prove that the Russian narrative is false.[7]

Outsourcing and Automating

In order to generate as much content as possible, as quickly as possible, the Russians have outsourced their efforts in several ways. First, they have recognized the unique ability of "**internet trolls**" to hijack an online forum by injecting polarizing and radical views, then stifle all debate through aggressive harassment of any individuals who challenge their narrative.[8] The Russian internet troll is able to succeed if they can successfully insert a disingenuous narrative into a conversation, if they can force the voices of competing narratives to disengage from the conversation or from the online platform entirely.[9] The other way that the Russians are able to quickly generate and spread disinformation is through the **use of automated accounts and Bots**. Automated accounts and Bots are able to exploit existing mechanisms in social media platforms to attract attention, engage with an audience, and then create a network of like-minded users and Bots to amplify and reinforce disinformation. Figure 1 illustrates how an interaction between a human user and a bot can lead to the human user's account being flooded with disinformation.

Mutually Reinforcing Efforts

The Russian Government then reinforces the disinformation introduced by **covert** bots and trolls, through **overt** media platforms that are known to

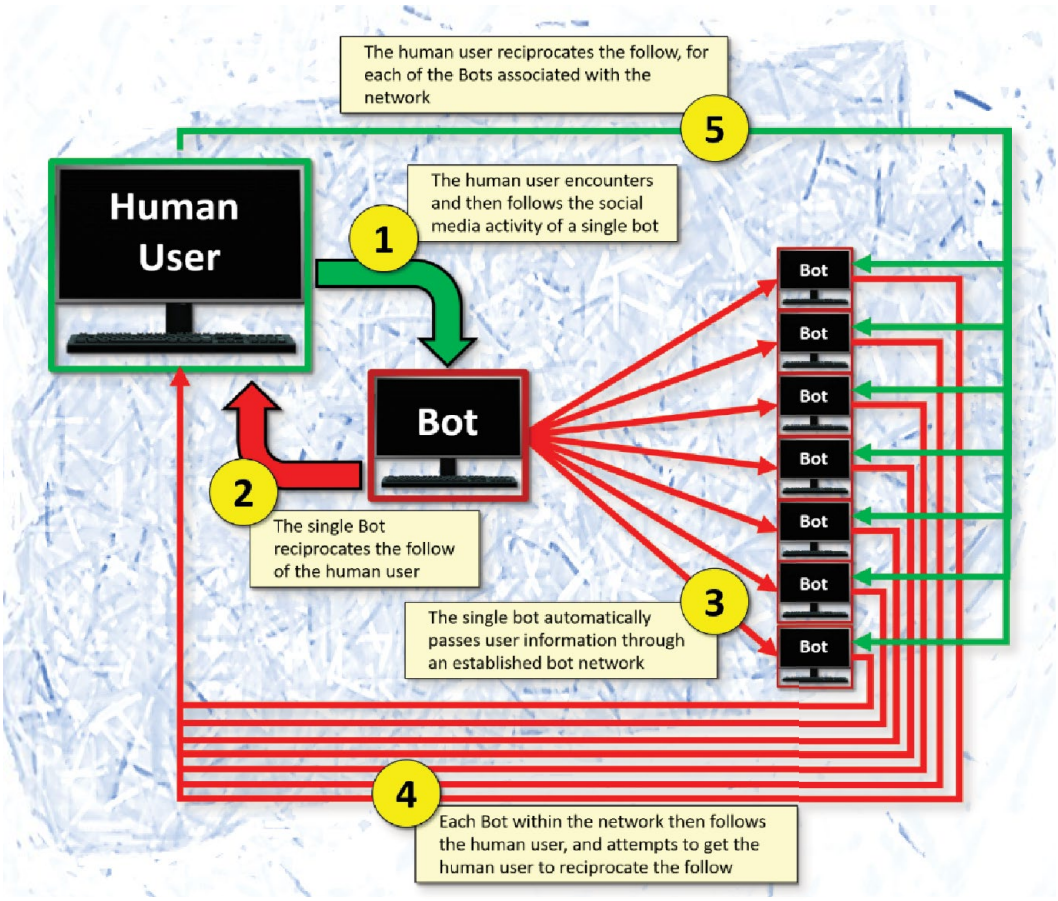

Figure 1. A simplified illustration of how malicious bots might interact with and eventually inundate a human user's information environment through social media.

be either funded by, or influenced by the Russian Government itself. By reinforcing disinformation found on social media platforms with disinformation being propagated by seemingly legitimate news sources, the Russians are able to rapidly spread disinformation through as though it were a complex contagion, through which multiple exposures from multiple sources increases the probability that a piece message will spread.[10]

The Russians do not stop with the introduction of disinformation and the silencing competing narratives. They also seek to **manipulate real people and events** within the targeted audience to internalize the message, and begin disseminating it themselves. The Russians seek to amplify their message through naïve but "useful idiots," to legitimize their message through ideologically sympathetic "fellow travelers," and to influence events through "agent provocateurs" who are either paid for, coerced, of manipulated by the Russian government or its proxies.[11] The Russians use online phenomena known as *echo chambers* and *filter bubbles* to trap their targeted audience in an information environment that is devoid of alternative views and discussion.[ii] By exploiting the tendency of individuals to have a bias toward new information that confirms their previously held beliefs, the Russians are able to create a layer of dissonance between their targeted audience and the real world.

Malleable Objectives & Ideologies

Though many of the actions associated with recent Russian disinformation campaigns are directly focused on swaying sentiment among a target audience, the SSCI also highlights that the Russians have identified the underpinnings of a healthy democracy as an **indirect objective**. The Russian government has long sought to undermine the perceived threat from western democratic institutions. Therefore, in shifting the political discussion and sentiment within a democratic population, they are indirectly seeking to force democratic governments to undermine their foundational principles through overbearing reactions that encroach upon civil liberties.[12]

By focusing their objectives at an extremely macro level, the Russian disinformation operations are able to have a **fluid ideology** of dissonance that guides their manipulations. In spite of the ideologically fluid nature of both previous and ongoing overt and covert actions, Russian state media has been able to promote and maintain distinct narratives in coordination with media proxies without undermining their own efforts.[13] Precarious actions that risk information fratricide are left to non-attributable sources.

In the case of interference in the US election, the objectives were to fracture democratic discourse and undermine democratic principles, "Russia's information operatives are unencumbered and can support any and all perspectives."[14] This enables Russian disinformation to seize upon single events that occur in a complex and fast paced environment, and to target all sides of

ii. Echo chambers occur when an individual finds themselves in an online network that continuously reinforces narratives and ideas; Filter bubbles occur when an individual either intentionally or unintentionally narrows the scope of content they interact with (i.e., avoid discourse and alternative perspectives).

the conversation, targeting and **exploiting existing fissures** within the population (e.g., economic inequalities and demographic pressures).[15]

By focusing on existing fissures, the Russians are able to avoid needing to introduce a novel narrative into the target population. The exploitation of existing fissures requires that malign operations are based upon an intricate understanding of socially divisive fault lines within the population, and driving targeted and timely "wedges" designed to limit discourse.[16] These wedges consist of false narratives, half-truths, and outright fictions designed to resonate with and exploit confirmation biases among the target population. They are also designed to challenge the credibility of competing sources of information by presenting alternative truths and overwhelming the audience

> *"But the Russians, you know, can't basically exploit cleavages if there are not cleavages. The Russian can't exploit corruption if there's not corruption. They can't exploit alternative narratives if those alternative narratives are not out there and getting credence. What the Russians do is they exploit things that already exist."*
>
> *— Dr. Fiona Hill, Former National Security Council Russia Analyst*

because there are too many versions of events, and they'll never know the truth. As discussed earlier, the speed at which the Russian disinformation is created, adapted, and disseminated allows them to utilize a quantity over quality approach, creating a large number of varying messages and only honing in once a specific message gains traction among the audience.

Replicating Depth & Complexity

The SSCI report focuses on Russian activity to influence a US population, however it also mentions that the Russians are conducting the same type of disinformation campaigns all around the world. In addition to their efforts to sway international opinions during the 2008 Russo-Georgian conflict, the Russians were also able to successfully weaponized information using information and communications technology in concert with conventional operations, creating confusion as "Georgian officers struggled to send orders to troops, and bewildered citizens had no way to find out what was happening."[17] Given their success at frustrating the Georgians, it is likely the US Army will observe, engage with, and be affected by similar Russian disinformation efforts regardless of where its Soldiers are operating. In order for Russian disinformation operations to succeed in the real world, the campaigns must be tied to existing grievances among the population, appear to share the perspectives of the aggrieved populations, and capable of pushing targeted populations beyond their tipping point, often using emotional appeals, to designed to either stoke tensions or force disengagement.

So the question is, what does this all mean for the US Army training community? In order to prepare the total force to *deter, fight, and win* against Russian disinformation campaigns, the training community has an opportunity to orient toward the challenge of creating a training environment that encapsulates the detailed conditions and characteristics required to enable Soldiers and leaders to develop and perfect their skills with regard information environment. The training OE should contain enough depth and complexity to replicate the real world OE characteristics that are utilized and exploited during Russian disinformation campaigns.

The current training OE meant to inform this process is arguably data rich, replete with enough raw data to support the replication of the aforementioned Russian *patterns of activity* associated information warfare. But that data rich training OE may actually be information poor due to a lack of organization, structure, and contextualizing narrative associated with the available data. All of which is required to inform how information is used to target a population.

This increased depth and complexity would enable the development and executing of increasingly realistic scenarios that challenge and test the analytic posture, decision-making, and reactions of training participants. In line with the ideas discussed throughout the 2016 White Paper written by USACAC on Enhancing Realistic Training, increasingly realistic OE conditions in training will help the Army develop a force capable of not only deterring, fighting, and winning against adversaries that seek to spread disinformation and use hybrid warfare, it will also enable Soldiers and Leaders to hone their ability to predict and preempt these type of threats and potentially shape the information environment in our favor ahead of potential adversary operations.

> *"In order to win in the complex world, we must enhance realistic training so that we train not only technical and tactical proficiency but also provide a training environment that has a robust representation of the complex interaction of the OE variables and poses physical, mental and ethical challenges to the training audience."*
>
> *— Enhancing Realistic Training White Paper, US Army Combined Arms Center, 2016*

In order to realize this complexity and better prepare the US Soldier to compete against adversaries like Russia, the training community may need to reflect on its current practices, from a critical perspective, in order to further enhance how it replicates the OE. In order to initiate this critical reflection, this article finishes with several yes/no questions, each of which may represent an opportunity to improve upon some of Army's training community's current practices. ◆

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Russian Crime: The Simmering Threat

By **MAJ Megan Williams,** OE&TA

For more than a decade, the United States was embroiled in two exhaustive global conflicts. The US was preoccupied with these commitments, becoming financially, physically, and emotionally drained. During that time, the concept of war and conflict shifted, but the US still emphasizes preparation for conventional warfare. In the current operational environment, global players prefer to compete below armed conflict, as deterrence is more challenging. By avoiding direct conflict and complicating the distinction between war and peace, these states have expanded the battlefield in time, domains, and geography.[1] Near-peer threats, including Russia, have been able to understand, plan, and adjust to this new dynamic, because it is to their advantage to avoid direct conflict with America. Now, the US is attempting to intellectually define and understand the broader context of competition warfare, edging past the binary concept of only war or peace.

Without these conceptual limitations, Russia has been able to pivot and diversify elements of national power to effectively influence or subvert the US government in active competition. No stranger to hybrid warfare, Russia has matured combinations of systems and concepts and is leveraging crime as a disruptive tactic during this competition, continuing to propagate ambiguity.[2] The United States must act now to identify and mitigate this threat.

Politics by Other Means

Contemporary Russia is in a transition period, as the country moves to align its internal concept of positional power against how the external world views it.[3] Russia's foreign policy is attributed to the Primakov Doctrine, which is centrally concerned with ending the Western-dominated world order.[4] In this doctrine, a unipolar, American-dominated world is unacceptable to Russia. Since Russia cannot achieve world domination through either military means or span of control, their secondary objective is to achieve regional hegemony.[5] Regional dominance in Eurasia would entail weakening neighboring states or continuing to degrade Western and NATO alliances.

Russia justifies this subversion and the subsequent aggression by maintaining a compelling victim narrative of Russia's subjection to political, cultural, and territorial injustices from the West.[6] Gaining recent regional experience in Georgia and Ukraine, Russia is currently developing momentum in creating and manipulating friction. Russia is allowing conflict to simmer without boiling over into overt hostilities and open warfare against the US, where armed conflict would be to Russia's disadvantage.

Russia is able to set conditions and leverage control beyond military power by utilizing non-traditional means to indirectly gain an advantage. By inserting state influence, overtly or covertly, Russia can create enough "strategic ambiguity" to distract their targets and weaken them.[7] The past two decades of President Vladimir Putin's leadership indicate his preferred method is a blend of hard and soft power.[8] Russian military leadership identifies and publicly proclaims that "nonmilitary means of achieving political and strategic goals has grown…and exceeded the power of force of weapons in their effectiveness."[9] However, as in both Georgia and the Ukraine, military force remains an option.

Russia is "strong on ambitions but weak on resources," thus, hybrid warfare is both a risk management technique and an economy of force effort.[10] Hybrid warfare, or maintaining competition with the United States below armed conflict, is not a new concept under the Primakov Doctrine. By employing other instruments of state power beyond just military efforts, Russia can leverage an "operational approach based on localized and temporal dominance at the expense of persistent dominance."[11] Russia has realized that the ability to instigate problems without the trouble or commitment of mobilizing the military can disrupt civil society enough that it creates dissonance and ultimately a vacuum that Russia may be able to effectively fill.

Russia does not and will not hesitate to incorporate a suite of options designed to target populations, including information warfare and propaganda.[12] These options allow degrees of separation between

the Russian government and the targets, because their actions are less attributable to either the government or military. Russia's dominance aligns with the strategy of "addition by subtraction," meaning that Russia grows stronger when its neighbors grow weaker.[13] Russia does not have to engage in open warfare to be gaining an advantage. Ultimately, Russia moves closer to their doctrinal goal and is able to achieve it with an economy of effort.

Russian Crime

Organized crime has long enjoyed a parasitic relationship with the Russian state, as Russia has a history of crime, corruption, and the culture that supports crime. "Corruption can be considered an incubator for the growth of organized crime, violence, and terrorism," and Russia has been a breeding ground for all three.[14] In a post-Soviet world, Russian organized crime has "complex relationships with the private market" because it has been able to not only co-exist, but also grow and flourish under the state.[15]

When Putin took office in 2000, he imposed a social alternative to criminals to be de facto coopted into the state, "so long as they understood that the state was the biggest gang in town and they did nothing to directly challenge it."[16] This unique symbiosis allows the government to participate in the criminal underworld and regulate its power. As long as organized crime did not threaten the state, the state would allow its existence. Russia leverages organized from for the government's behalf for resources, operational capacity, and intelligence efforts.[17] Effectively, the state can leverage crime to their advantage by having an implicit agreement about the strategic stakeholder relationship with these criminals.

War by Other Means

As a result, criminal organizations can act as aberrant proxies for the state by engaging in specific criminal activities sanctioned by the Russian government because it provides cover for the state's nefarious actions and a cost effective way to achieve their goals and increase the collaboration between these two entities. Thus, new techniques, like cybercrime and social media attacks, are less attributable to Russian innovation and disguisable as a part of inevitable modernization in a global world.

Criminals, like terrorists, are beneficiaries of globalization and digitization and connectivity have expanded their reach.[18] For example, Moscow can recruit cybercriminals to use for their purposes, when they can provide 'surge capacity' for official state operations, such as attacks on Estonia in 2007 and Georgia in 2008. The government establishes enduring relationships so the criminal elements are available when needed for an asymmetric means to affect a national or international target. It is also easier for the government to outsource hacker operations to mercenaries than to build the capacity within their intelligence services.[19] The US defense community is building capacity within the cyber domain, but the technological terrain of cyber-attacks strongly benefits the offensive.[20]

Russia can mobilize criminal actors against the United States or against NATO; either way, it weakens the alliance and benefits Russia in two ways. First, it provides a distraction and attrition of state resources for the US to deal with crime, even if the US is not aware that it is being targeted by a state actor. Under the assumption that crime is a domestic issue, it takes attention away from military and defense issues, and requires the US to develop new capabilities and strategies.

Additionally, the complexity of crime is now heavily networked and interconnected. Criminals are now able to be so networked and interconnected that they can essentially outsource criminal behavior through a network of allies and contacts, causing destabilization to countries and states when the criminal instigators are not physically present.[21] These two levels of separation (first, Russia from the Russian criminals and second, Russian criminals from a global crime syndicate) provide even more benefits for the state to continue operating in this way.

Recommendations

Offensive criminal activity in Russia is sanctioned by and leveraged by the state. While it is not difficult to understand the interconnected nature of this problem, it is challenging to understand how to defeat or dismantle it. Based on the growing complexity of this problem, the longer the United States takes to understand and address it, the more sophisticated state-sponsored crime grows. The US must take two immediate steps, cognitively and behaviorally. First, the US should quickly abandon any conceptual limitations about hybrid warfare. In the current hyper-connected world, we should cast off any previous assumptions about what warfare is and understand that near-peer threats will continue to exploit the ambiguity of competition with the US, precisely because it will be more challenging for us to determine an appropriate response.

Russia, as our adversary, is unapologetically willing to make attacks in any forms and on any scale, even if it is something that Americans would not be willing to do. We cannot let our ethical restrictions about how Americans would engage in competition limit our detection of how adversaries engage us. Criminal intelligence must be understood as part of the common operating picture, because it produces indicators of vulnerability and disruption. The presence of crime indicates that an area or population is susceptible to

manipulation and damage by an unlawful criminal entity, causing instability in ways that America would not reciprocate with.

Secondly, the US must create identification strategies and means to address the crime threat in the context of foreign intervention. These threats are not just the realm of law enforcement.[22] Identifying the Russian threat is not enough if it does not produce effective action. We need particularly sophisticated awareness and tracking to identify and combat these crime networks and trace them back to their origins. Law enforcement coordination and cooperation between local and federal entities has been an area of emphasis since 2001, but in the context of preventing terrorist attacks on US soil. However, since threat adversaries in the operational environment are also willing to engage in crime as part of competition, this networked coordination must continue to evolve and expand. Existing institutions, primarily joint task forces, between local and federal authorities must grow and restructure to effectively communicate requirements with the field. Locally, law enforcement must be able to identify patterns and vulnerabilities. The federal law enforcement network must be able to effectively communicate with local sources to identify larger correlations, transmitting those developments within the larger federal government to incorporate that knowledge into instruments of national power, with responses being diplomatic, informational, military, or economic, or any combination.

Pragmatically, information fusion between local and federal authorities is not without challenges already, especially considering the volume of information potentially pertaining to terrorism. Both local and federal law enforcement must be aware of the Russian strategy, because the goal is not a violent attack, like in terrorism, but to be disrupting and damaging to the American population and economy. "When it comes to homeland security, local police play the most fundamental and largest role,"[23] and to be able to have the most comprehensive protection, there must be a national understanding that homeland security includes both crime and terrorism.

Identification will strengthen a hybrid requirement in our country: to marry law enforcement with intelligence and determine how these threat actors will be dealt with. The police will want to prosecute the criminals while the intelligence will want to monitor or exploit them.[24] The US will need to develop a collaborative mechanism of both active and passive measures to prevent Russia from using criminal activity to disrupt, degrade, or destroy our capabilities. The current stove piped bureaucratic process creates friction that slows down (or completely prevents) this fusion.

As the US gains a more comprehensive understanding, the government has the difficult and tenuous challenge of how to address Russian crime. The United States faces a distinct paradox of how to respond. For the US to address the crimes, and identify Russia as the culprit, will justify Russian claims that the US is targeting them. To ignore the threat will allow the simmering problem to boil and grow, gaining complexity and sophistication, and the US will get burned without seeing it coming. ◆

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Deception and Information Warfare

By **Jerry England,** OE&TA

US joint doctrine describes military deception as deliberate actions to mislead adversary decision makers, and information operations are employed to influence, disrupt, corrupt, or usurp the decision-making of the adversary. It follows that both deception and information operations are mutually supportive activities that place a high value on understanding the level of reliance and ultimately breaking up command and control (C2) information systems and processes.

The reliance on digital information systems for combat operations is a concern for US joint forces and threat actors as well. Recognizing the considerable value of the information and technology to the C2 process threat actors will prioritize operations to degrade friendly communications and sensors while protecting their own systems and infrastructure.[1] Deception techniques like disinformation, misinformation, feints and ruses are among the most useful tools when attempting to confuse the friendly commanders' understanding and ultimately affect their decisionmaking process.

The "profound position" information holds in the threat's assessment of joint operations will require friendly forces to double their efforts to protect and control the information environment foreseeable future combat situations.[2] The disruption and manipulation of information through deceptive techniques will continue to be a central component for threat actors seeking to influence actions and events across the spectrum of combat. From decoys and camouflage, to electronic attacks, and manufactured civil unrest, the information environment affects practically all operational domains and is evolving into a potentially decisive component of modern warfare.

Deception in the Operational Environment

The threat's use of deception techniques to deny, degrade, and disrupt the flow of information is applied as a cohesive plan with adherence to known rules for implementation. Russian forces emphasize activity, plausibility, variety and continuity as foundational principles for deception operations.[3] Chinese military theory on the other hand, recognizes all combat as a form of deception with unconventional techniques, indifference to rules and norms, ambiguous conflicts, and temporal superiority as guidelines for implementing deception.[4] These concepts are set in opposition to US joint doctrine which describes deception principles in terms of focus, objective, centralized planning, security, timing, and integration. While the labels and priorities differ the one unifying aspect of deception operations is the synchronization and coordination required for both the deception plan and the broader operational mission.

"How do you make a cat eat a hot pepper? You can stuff the pepper down the cat's throat (the most difficult), you can put the pepper in cheese and make the cat swallow it, or you can grind the pepper up and spread it on the cat's back. The latter method makes the cat lick itself and receive the satisfaction of cleaning up the hot pepper."

— Major General Li Bingyan, 2004

Deception Applications

Emerging technologies such as AI enabled "deep fakes", advanced natural language processing, and so called precision propaganda are making it easier to manipulate information and human reasoning through the use and exploitation of existing user data. The ability to create tailored themes and messages will be enhanced by leveraging the threat's in depth understanding of the operational variables of area of operations. With automated tools like advanced content distribution networks, it is foreseeable that a level of precision could be produced through the application of current analytical and coercive computer applications.

The ability to influence local rivalries through manipulative social media posts could create significant unrest and help the threat defeat friendly forces through the increase in violence and unrest.

High tech electronic warfare (EW) platforms and deception tools such as digital radio jammers and multi-spectral decoys can potentially degrade the effectiveness of modern collection assets, disrupt the transfer of intelligence data to decisionmakers, and produce false analytical conclusions. Operating across multiple domains, deception elements can create or deny detection signatures and possibly defeat advanced systems that rely on converting signatures to digital information for use in C2 systems.

Successful employment of deception activities can force friendly forces to over commit or under commit combat power against an unknown verified enemy situation. Increasing ambiguity and confusion through sensor false positives is one way deception activities can delay the decision making process and increase threat actor's operational flexibility. As an example a defensive belt of decoys may stall the friendly advance long enough to call in a damaging artillery strike. As long as the deception continues the adversary has the ability to exercise a range of operational alternatives.

Another example could be a deception effort that targets the friendly commander's cognitive biases or false assumptions. This approach exploits the rule that it is better to reassure someone who believes wrongly rather than it is to convince them of something that is not true. For example, by presenting false signatures that match well known doctrinal templates the adversary can lay an ambush at for an attacking force at the time and place of its choosing.

Other technical means designed for the cognitive aspect of the information environment can influence friendly forces perception of the battlefield through false news stories, disinformation, and deceptive communications from compromised frequencies and civilian phones. Successful deception operations in the perception management or cognitive layer can be used as a way to confirm a friendly commander's biases toward a certain enemy course of action and lead them to possibly expedite the decisionmaking process against a false set of conditions. By misrepresenting the situation based on the commander's preconceived notions the threat will have achieved the goal of causing the friendly forces to self dis-organize and or dis-orient by changing the tempo of the battle.

By adding thorough electronic, acoustic, and thermal means to the signatures of multimodal decoys the threat will appear larger where it is small and smaller where it is large, thus confusing the friendly commander and the staff. Successful execution of the EW deception operation can be measured by the amount friendly forces committed to defending against the false attack.[5] Unconventional tools including cyberattacks, disinformation, political interference, and illicit finance sequenced to bring about the threat's deception plan, the more varied and persistent the indicators the more likely the threat's efforts will be successful. By carefully using deception techniques and avoiding a windfall of indicators that defeats the ruse threat actors can manipulate possibly misdirect friendly forces into a self-defeating situation or at least cause enough confusion to delay their plan.

The use of technical means is not the only way the threat will attempt to use deception to gain an advantage. Basic false flag techniques within the variety of combat and non-combative actors on the battlefield increase cultural standoff at the tactical level and exploit the friendly force's unfamiliarity with the region. For example, non-government or charitable organizations with allegiances to a threat actor can engage in subversive activities while at the same time operating under the guise of humanitarianism. The threat will also seek to infiltrate allied forces and if given the opportunity use violence, graft, and non-compliance in an attempt to disrupt friendly and allied forces relations.

"The goal of Reflexive Control is to prompt the enemy to make a decision unfavourable to himself. Naturally, one must have an idea about how he thinks."

— Colonel S. Leonenko, 1995

Deception Operations in the Cyberspace

Cyberattack tools like the deceptive technologies mentioned above are designed to mislead through manipulation and distortion of trusted systems in order to induce a reaction that makes friendly forces more vulnerable to the effects of threat weapons. Similarly cyberattacks that use social engineering, misinformation, and obfuscation techniques can achieve similar results and create windows of opportunity for the use of digital weapons that degrade friendly warfighting systems and or important friendly infrastructure.

Generally, most cyber activity employs deception in one form or another. One of the most basic methods for

attacking an information system is known as a "Trojan horse" arguably the most famous deception operation in history. But instead of a large mobile structure full of Greek warriors, malicious software (malware) is delivered to a targeted computer system after the user opens a seemingly innocuous attachment. The Trojan horse software releases its payload and attacks the target systems either by stealing sensitive data, controlling the target computer system, and or launching a debilitating attack.

Other forms of cyber deception can come in the form of a compromised computer systems known as "bots" and their malicious networks known as "botnets." Botnets can be used for a range of purposes, from sending unwanted emails (spam), to creating more bots (zombies), to mining crypto currencies for nefarious purposes. The key element is that the bots are trusted by the target systems and are able to breach them by posing as legitimate hosts.

The widespread use of networked technologies and common software suites for warfighting is part of the reason that hackers could potentially affect multiple friendly C2 systems. Many attacks that seem to be a routine nuisance can contain dangerous payloads of malware that attackers use to penetrate friendly systems of systems. The convergence of military automated systems with commercial and civilian software and hardware as well as the increasing interaction with unknown third party contractors can increase the potential for a network attack. For example, day to day interactions such as participating on social media or online shopping can open defense systems to potential attacks.

Threat actors that have an understanding of friendly forces information systems, hierarchical structures and operational processes, can use cyberattacks to breach networks and alter interconnected logistics, resupply, and personnel systems.[6] Reports dating back to 2008 show how threat actors from Iran had intercepted satellite video from unmanned aerial systems using commercial software, thus compromising the integrity of the information the ground commander uses.[7] The threat routinely uses its knowledge of processes to locate vulnerabilities and compromise friendly operations, but the activities are not always information or networked based; in some cases the individual Soldier is a target.

The low risk high payoff nature of cyber operations will make them more and more common as warfighting processes move further into the digital age. The flipside of these types of operations however are a risk that digital weapons once used can potentially be used against their creator. The risk—sometimes known as the "monkey's paw"—relates to the unintended consequences of issuing a successful attack in cyberspace only to have in backfire in a modified form.

Psychological Deception

Threat actors looking to affect the morale of Ukrainian troops had taken to sending threatening false text messages regarding their chances of survivability to the frontlines of the conflict in eastern Ukraine.[8] Messaging that promotes a false narrative that highlights the brutality and the illegitimacy of friendly operations can degrade morale and affect the discipline of friendly troops if counter arguments fail to take root. Other activities aimed at the civilian population may also contribute to discontent and mistrust of friendly forces concerted through social media, attacks on infrastructure, and the takeover of media outlets by threat actors.[9] The perception that the legitimate government is not in control and cannot help the population is a misinformation technique that deceives the target audience into believing they must either leave or choose a side and fight.

Psychological warfare and the battle for ideas will target the friendly commander's misperceptions, cognitive biases, or their ignorance of battlefield events and actions. These personality traits if revealed can emerge as vulnerabilities that can be exploited for the threat's purpose. Deception efforts and manipulation of data flows contribute to the fog of war and create windows of opportunity for threat actors to gain control of the information environment while denying it to friendly forces. The conflation of events and the misdirection of accusations of responsibility can compel the friendly commander to miscalculate battlefield conditions, such as their ability to estimate outcome probabilities, evaluate the situation, and establish cause and effect. Recent offensive operations in the Ukraine, the Georgian republic, and in counter insurgency operations in Syria have shown the effectiveness of so called "reflexive control" operations.[10] In each conflict the use of surprise, information denial, disinformation, and deception were used to misrepresent the true intent of the threat's operations and set conditions for a military victory while remaining below the threshold of a traditional military response from western nations.

Agility and Counter Deception

The use of advanced C2 systems that combine multiple information inputs into a unified operating picture are part of the research and development efforts of threat actors wanting to leapfrog older legacy systems

and win in the information enabled battlefield. Military communications satellites such as the Chinese Fenghuo series are providing unified communications using domestically produced technology to Chinese army units in the field.[11] Developing position navigation and timing systems such as the Chinese Beidou and Russian GLONASS are likely compatible with US GPS as well as their own national standard.[12] While the threat technology has historically lagged behind advanced militaries, their reliance on human solutions for situation awareness has in some ways closed the gap. However, technological initiatives and the increased availability of information communication technology appears to be improving threat systems C2 capabilities. Irregular forces armed with mobile access to operationally significant opensource data can improve the threat's situational awareness and improve interoperability with regular forces. Friendly forces that include deception as part of their operational strategy will have to contend with threat actors who are achieving parity with regard to network enabled warfare. Systems such as the Russian YeSU battlefield management system provide situational awareness of both friendly and enemy forces through a combination of multiband wireless inputs from reconnaissance to fire support systems.[13] The ability to provide real-time status reports will allow threat force commanders to not only gain valuable feedback on their deception efforts but also react decisively when faced with a potential deceptive situation. Improved C2 will improve the threat force's ability to react and realign their forces to exploit the situation.

The integration of machine learning and big data will aid the threat in controlling the information environment at machine speed and create overmatch for a range of processes such as piloting swarms of unmanned systems, intelligence analytics, and improved command and control capabilities.[14]

Implications for Training

The integration by threat actors of multi-domain deception activities should lead US forces to ensure they are prepared to meet the challenges of modern warfare. This includes technical solutions as well as organizational solutions. Having the training to deal with preventing, countering, and in some cases recovering from threat information warfare will require a cross functional approach. The ability to protect and possibly attack in the information environment will involve the use of advanced communications and electronic warfare systems. The ability to recognize threat deception techniques will mean improved sensors with increased sensitivity and communications capability. The need for more information to be collected, assessed, and disseminated at combat speed is a necessity for conflicts of the foreseeable future.

The solutions will not all be technical, however, as the need to deal with local populations and their interpretation of events will require cultural and regional experts who can establish the friendly force as legitimate stakeholders in the contested areas. An expansion of support operations to include not just the friendly forces but elements of the local population as well will require expertise from military members not just in their respective fields but also in the art of civil military relations with a foreign entity. Maintaining situational awareness through technical means as well as through networks of non-government and international organizations can assist the friendly force in better understanding the nature of the conflict and reduce the risk of being deceived in the information environment. ◆

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TRADOC G-2 SME CORNER

Movement Along the Belarusian Front

By **Ray Finch,** Foreign Military Studies Office

Ray Finch provides insight on Russia's relationship with Belarus, as well as a potential future that would change Russia's dynamic with NATO in Movement Along the Belarusian Front. *The Belarus economy is dependent on Russia and Belarus President Lukashenko has walked a tightrope to maintain Belarussian autonomy. Putin exploits this dependency, as well as aspects of a 1999 agreement to form a union state, which has never been fully implemented due to Lukashenko's deft maneuvering. If Putin arranges Lukashenko's departure from office and creates the union state, then he would be able to continue as leader of a newly expanded Russia, instead of leaving office when term limits require in 2024. This would effectively create a shared border between Russia and NATO members Poland and Lithuania. While Russian troops are often stationed in Belarus, exercise there (i.e.,* Zapad *(see the November 2017 issue of* OEWatch *at community.apan.org/wg/tradoc-g2/fmso/)), and often transit through Belarus and the Suwalki Gap to and from Russian Kaliningrad, under a union state Russian forces across all domains could be stationed permanently on NATO's border. This could place the Suwalki Gap in jeopardy of a fait-accompli takeover similar to Crimea.*

However, union between Russia and Belarus could face the broader problem of opposition by the Belorussian population, who mostly resent Putin's repeated reference to Russians and Belarusians as "one people." While this attitude will likely not escalate to open revolt, it could threaten internal stability, which is one of the consistent objectives across Russian strategy. (see Katri Pynnöniemi's review of Russian strategy documents in The Russian National Security Strategy: shaping perceptions and coordinating actions *in this issue). Further, Belarus's weak economy, burdened by heavy social subsidies, would be a drag on the already strained Russian economy. Regardless, Putin will maneuver to retain power in some manner and to keep Belarus within the Russian sphere of influence.*

Reflecting their realpolitik view of the world, Kremlin officials often quote Tsar Alexander III who remarked that "Russia has just two allies, the armed forces and the navy."[1] Russian leaders today would also count their neighbor Belarus among their close allies. However, due to a difference in views as to the proximity of this alliance, the strength of the Russian-Belarus relationship has recently come under strain. This brief paper will provide a thumbnail sketch of the Belarus-Russia relationship, a few of the current contentious issues, and possible tools which the Kremlin might employ to ensure that Belarus remains aligned with Russia.

While it has enjoyed independence since 1991, for many Russians, Belarus (like Ukraine) is not a truly sovereign state. These Russians would agree with President Putin who has repeatedly asserted that Russians, Belarusians and Ukrainians are "one people," and that the borders between these countries are merely administrative.[2] And although the term has become offensive to those living in Ukraine and Belarus, mentally speaking, many Russians still regard these countries as part of "Little Russia," (Малая Россия, *Malaya Rossiya*). The deep belief that these countries "belong" to Russia forms the basis of Kremlin policies toward Ukraine and Belarus, (and the source for many of the problems).

Similar to Ukraine, Russian historians have argued over the notion of a distinct Belarusian national identity. For the past 500 years, Belarus national character was weakened by their much larger Russian neighbor. The horrors of the 20th Century (WW I, Civil War, collectivization, WW II) further diminished a separate Belarusian ethnos and language. The Belarus proclamation of independence in 1991 had as much to do with weakening the already decrepit power of the centralized Soviet bureaucracy than with proclaiming a separate Belarusian identity.

Like the former republics of the USSR, the first few years of independence for Belarus were economically extremely painful. By promising a return to some of the social and economic security provided under the Soviet model, in 1994, the former collective farm director, Alexander Lukashenko was able to beat challengers to become the second president of an independent Belarus. Since then, Lukashenko has worked to consolidate his control over the country, dismantling the weak democratic structures which appeared after the collapse of the Soviet Union. For the past 25 years, by leveraging generous subsidies from Russia, Lukashenko has been able to maintain a USSR-lite economy and social model in Belarus, where workers are provided with decent wages and benefits, in exchange for their political passivity.

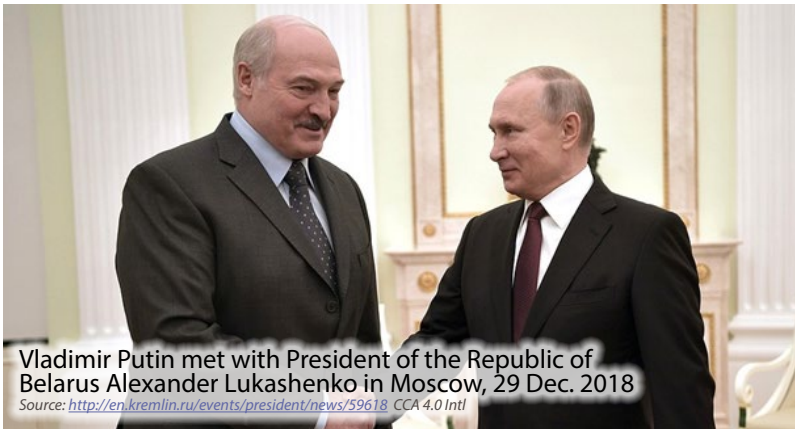
To compensate for the Russian economic largesse, Kremlin leaders (Yeltsin, Putin, Medvedev and again Putin) have demanded certain concessions from Belarus. In 1999, the two countries agreed to form a Union State whereby Belarus would be merged into the Russian political, economic and security systems. While there has been plenty of discussion over the past twenty years as to how this Union State would operate, its actual implementation has been delayed—mostly by the clever maneuvering of President Lukashenko, who has grown increasingly reluctant to cede elements of Belarus sovereignty.

Lukashenko's desire to remain independent of Kremlin influence became more pronounced after Russia annexed Crimea and became militarily involved in the Donbas in early 2014. For the second time within a decade (Georgia, 2008) the Kremlin reminded Russia's neighbors of its great power pretensions. However, being economically dependent upon Russia has reduced Lukashenko's maneuver room. While he has resisted pressures to either recognize Russia's ownership of Crimea or to allow Russia to open a new airbase in Belarus, Kremlin *domestic politics* may soon force Lukashenko to show greater enthusiasm toward establishing a Union State with Russia.

The transfer of political power within Russia has often been fraught with tension, and already today, Kremlin officials are planning for who will lead the country when Vladimir Putin's current term as president ends in May 2024. One possible option revolves around a scheme to allow Putin to remain at the Kremlin helm as leader of this new Union State with Belarus. Presumably, this new "state" would require a new constitution, and thus Vladimir Putin would be permitted to run for the highest office. While such a proposal would be amenable to a large percentage of Russians, it is not so popular among the Belarusians, particularly the elite.[3]

The two presidents have met nearly 20 times over the past 15 years (twice in December 2019) to discuss specific details of how this new Union State will operate. While no final decisions have yet to be made, after their 7 December 2019 meeting in Sochi, one Kremlin insider suggested that Lukashenko was offered the role of head of the Union Parliament. According to the source, Lukashenko apparently turned down this offer and is still trying to both to preserve his role as the Belarusian leader and the country's independence.[4]

Belarusian presidential elections are scheduled for August 2020, and while today Lukashenko is almost guaranteed to win against a non-existent opposition, much could change over the next eight months. For instance, should Lukashenko prove less than enthusiastic in actually forming the new Union State with Russia, the Kremlin could apply significant economic and information pressure to either ensure his compliance or make his re-election difficult.



Vladimir Putin met with President of the Republic of Belarus Alexander Lukashenko in Moscow, 29 Dec. 2018
Source: http://en.kremlin.ru/events/president/news/59618 CCA 4.0 Intl

Russian domestic politics, however, is not the only driver behind this renewed interest in forming a Union State with Belarus. From a military perspective, a mere glance at a map of Russia and Eastern Europe makes it readily apparent why the current Kremlin leadership is adamant that Belarus remains within its sphere of influence. While European countries may look at raw military power as quaint and outdated, memories of a Western threat have been scarred upon the Russian DNA. Kremlin military leaders value having a strong buffer on their Western border. Since the Baltic countries have already joined NATO, and with today's Ukraine moving in a pro-Western direction, Russia can simply not allow the strategically important Belarus to follow suit.

Making specific predictions regarding the Kremlin's foreign policy remains a losing proposition. Nevertheless, since regime preservation continues as the primary strategic objective, and because Vladimir Putin's presence has become so essential in defining and managing this regime, the likelihood that the Kremlin will prolong Putin's rule with the creation of a Union State with Belarus could be a smart bet. ◆

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TRADOC G-2
SME CORNER

The Russian National Security Strategy:

shaping perceptions and coordinating actions

By **Katri Pynnöniemi,** Assistant Professor, University of Helsinki and the National Defence University

Dr. Katri Pynnöniemi's review of Russian strategy documents in The Russian National Security Strategy: shaping perceptions and coordinating actions *is revealing. Russian national strategy is consistent across multiple organs of the Russian government and focused on several main themes. Dr. Pynnöniemi rarely mentions Putin, but his hand is evident in the presence of the same themes that he has stressed publically for years. The strategy documents show Russia competing globally for "power and prestige" and locally for national sovereignty. Russia is painted as on the defensive against the West, which continues its Cold War policy of containment and is the instigator of all instability areas of Russian influence. These documents largely apply both internationally and domestically, as maintaining stability is a key theme. This justifies Russian actions as self-defense against Western-instigated aggression. The documents stress the multi-domain aspects of competition with the West, reaffirming the US Army's emphasis on Multi-Domain Operations. Overall, the insights into Russian strategic thinking in relation to the West provides a view to how Russia will pursue its interests and therefore what the Army may face within the Russian sphere of influence and why.*

Security strategies: anticipating a new cycle of revisions

Since 2014, Russia has renewed all its key documents on security and military affairs. The list is impressive. The drafting of the military doctrine started in 2013 and the new doctrine was approved in December 2014. It registered a heightened perception of threats towards Russia and emphasized the importance of informational and other non-military measures. A year later, the National Security Strategy[1] outlined a vision of Russia's role in the world, strategic interests, and means to achieve them. After these main strategic planning documents were out, specific thematic strategies and concept papers have followed suit. In 2015, the new Maritime Doctrine replaced the 2001 version. The new versions of the Foreign Policy Doctrine and the Information Security Doctrine were approved in 2016. After a short pause, the Energy Security Doctrine was approved in May 2019, followed by the Strategy on Artificial Intelligence in October 2019.

A new cycle of revisions has already started. The first in line is the National Security Strategy. A new version is expected to be published in 2020.[2] The Russian Security Council is also drafting a master plan for the development of national power agencies, including the armed forces, other security force structures and the military-industrial complex.[3] The fate of the Military Doctrine is still undecided, at least according to secretary of the Security Council Nikolai Patrushev.[4] However, it is unlikely that this new round will bring paradigmatic changes to Russia's military and foreign policy.

Strategic narratives about Russia's role in the contemporary conflicts

As I've argued earlier, the current version of the National Security Strategy "sees the world through the prism of strategic stability, whereby the military component of national security is emphasized and Russia's position in the world depends on the 'correlation of forces' – the country's ability to use the full spectrum of means in the competition for power and prestige"[5]. The general contours of the strategy are unlikely to change. In its current form, the text adheres to the core narratives with which Russia seeks to maintain room for maneuver in the future conflicts.

The strategy creates an image of Russia as a target of containment. This image can be traced to the so called *besieged fortress narrative* where Russia, especially the Russian political decision-making system, is seen as a target of malign outside interference. The National Security Strategy and later public commentary presents Western governments as responsible for aggravating the security situation in the world, and especially in the regions adjacent to Russia. The regional conflicts in the Commonwealth of Independent States (CIS) area are portrayed as tools to contain Russia, as these conflicts undermine Russia's privileged interests in the region. The military doctrine increased the stakes by arguing that "military threats and dangers have shifted to the information space and to Russia's domestic sphere".[6]

The political leadership has referred to this assessment before and after the doctrine was approved. For example, in July 22, 2014 meeting with the members of the Russian Security Council, President Putin argued that:

> Attempts are clearly being made to destabilize the social and economic situation, to weaken Russia in one way or another or to strike at our weaker spots, and they will continue primarily to make us more agreeable in resolving international issues. So-called international competition mechanisms are being used as well (this applies to both politics and the economy); for this purpose the special services' capabilities are used, along with modern information and communication technologies and dependent, puppet non-governmental organizations – so-called soft force mechanisms. This, obviously, is how some countries understand democracy.[7]

Another main narrative inherent in the strategy originates in the Soviet era 'myth of Soviet/Russian aggression'. It represents the West as an active force undermining the world order and strategic stability and subsequently, creates an image of Russia as passive observer of the conflict.[8] This narrative is used to represent Russia's actions as defensive, aimed at *countering* the malign Western plots against Russia. Actually, this view runs through all of the main strategy documents. (see Table 1.) Perhaps in the clearest form it appears in the National Security Strategy. It states that:

> Interrelated political, military, military-technical, diplomatic, economic, informational, and other measures are being developed and implemented in order to ensure strategic deterrence and the prevention of armed conflicts. These measures are intended to *prevent* the use of armed force against Russia, and to protect its sovereignty and territorial integrity.[9]

Interpretation: institutionalized power vested in the strategy?

The previous section focused on the ways in which the strategies function as a resource for strategic communication and deception. It suggests that the strategy documents aim to shape general understanding of contemporary conflicts and Russia's role in them. However, the security strategies clearly have other functions as well. For example, the National Security Strategy forms "the basis for shaping and implementing state policy in the sphere of safeguarding the Russian Federation's national security". More concretely, the strategy is intended to consolidate the policies and actions of different state agencies and civil society actors in an effort to create "favourable internal and external conditions for the realization of the Russian Federation's national interests and strategic national priorities."[10] This is, in essence, a key paragraph in the strategy, for it expresses both the function of the strategy (as a guideline for policy-making), and the direction of the policy (the creation of favorable internal and external conditions).

The extent to which different stakeholders can influence strategic planning process in Russia is difficult to assess. The role of informal networks in the Russian political system is considerable, and therefore, official administrative position does not necessarily translate into political influence. However, it is safe to assume that the Kremlin sets the overall strategic priorities for military and foreign policies. Thereby, a radical shift in the security priorities would require a paradigmatic change in the composition of power in the Kremlin. From the key agencies involved, the General Staff of Russian Armed Forces is responsible for the revisions made to the military doctrine. The role of the Security Council is also important. It is formally the key entity responsible for drafting the main security related strategy documents.[11] The council has several working groups that reflect Russia's main areas of interest: global problems and international security, problems in the CIS-countries, military-industry and technology development, economic and social security, military security and the information security.[12]

A comparison of the key strategies shows that all of them define contemporary conflicts and the threat environment in a similar way (Table 1). Even if individual strategies may emphasize different aspects of the threat environment, there is a consolidated vision of Russia's strategic priorities. However, in conclusion it is important to emphasize that the National Security Strategy and other documents do not provide a blueprint to predict Russia's future actions. Rather, their detailed analysis may contribute to the better understanding of the logic upon which Russia operates in competition and conflict. ◆

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Table 1. Comparison of the main strategic documents. The figure in the end of each paragraph refers to the Article in the document.

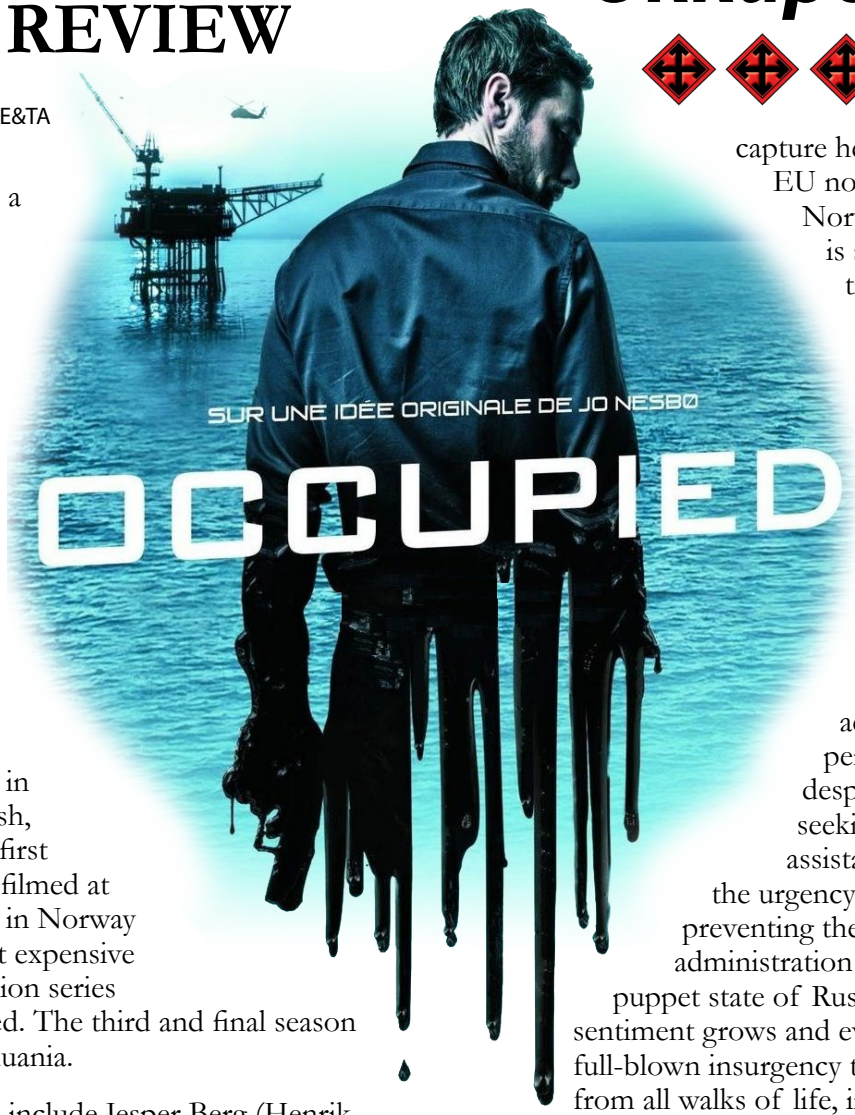
Description	Military doctrine (2014)	National Security Strategy (2015)	Foreign Policy Doctrine (2016)
Contemporary conflicts	Integrated use of military force, political, economic, informational and other non-military measures, implemented together with the widespread use of the protest potential of the population and special operation forces (15a)	An entire spectrum of political, financial-economic, and informational instruments have been set in motion in the struggle for influence in the international arena. Increasingly active use is being made of special services' potential. (13)	Alongside military might, other important factors allowing States to influence international politics are taking centre stage, including economic, legal, technological and IT capabilities. Using these capabilities to pursue geopolitical interests is detrimental to efforts to find ways to settle disputes and resolve the existing international issues by peaceful means on the basis of the norms of international law. (8)
Sources of conflict	World development is presently characterized by increasing global competition, tensions in the various areas of interstate and interregional interaction, rivalry of values and development models, instability of economic and political development processes at the global and regional levels against the background of a general complication of international relations. A gradual redistribution of influence in favor of the new centres of economic growth and political attraction. (9)	We are seeing an exacerbation of contradictions linked to the unevenness of world development, the deepening of the gap between countries' levels of prosperity, the struggle for resources, access to markets, and control over transportation arteries. The competition between states is increasingly encompassing social development values and models and human, scientific, and technological potentials. (13)	Tensions are rising due to disparities in global development, the widening of prosperity gap between States and growing competition for resources, access to markets and control over transport arteries. This competition involves not only human, research and technological capabilities, but has been increasingly gaining a civilizational dimension in the form of rivalry of value orientations. Against this backdrop, attempts to impose values on others can stoke xenophobia, intolerance and conflict in international affairs, leading ultimately to chaos and an uncontrolled situation in international relations. (5)
Active defence	The military policy of the Russian Federation is aimed at deterring (*сдерживание*) and preventing military conflicts, improving military organization, forms and methods of using the Armed Forces, other troops and entities, increasing mobilization readiness in order to ensure the defence and security of the Russian Federation, as well as the interests of its allies. (18)	Interrelated political, military, military-technical, diplomatic, economic, informational, and other measures are being developed and implemented in order to ensure strategic deterrence and the prevention of armed conflicts. These measures are intended to prevent the use of armed force against Russia, and to protect its sovereignty and territorial integrity. Strategic deterrence and the prevention of armed conflicts are achieved by maintaining the capacity for nuclear deterrence at a sufficient level, and the Russian Federation Armed Forces, other troops, and military formations and entities at the requisite level of combat readiness. (36)	As a permanent member of the UN Security Council and a participant in a number of influential international organizations, regional frameworks, inter-State dialogue and cooperation mechanisms, the Russian Federation contributes to the development of a positive, well-balanced and unifying international agenda by relying on substantial resources in all areas of human activity and pursuing a foreign policy that actively seeks to develop relations with the leading States, international organizations and associations in various parts of the world. (20)
NATO	Main external military dangers: building up NATO's power potential and endowing it with global functions implemented in violation of international law, bringing the military infrastructure of NATO countries closer to the borders of the Russian Federation, including by further expanding the bloc. (12a) Activities of the Russian Federation to contain and prevent military conflicts: maintaining an equal dialogue in the field of European security with the European Union and NATO. (21h)	The buildup of the military potential of the NATO and the endowment of it with global functions pursued in violation of the norms of international law, the galvanization of the bloc countries' military activity, the further expansion of the alliance, and the location of its military infrastructure closer to Russian borders are creating a threat to national security. (15) The Russian Federation is prepared for the development of relations with NATO based on equality for the purpose of strengthening general security in the Euro-Atlantic region. The depth and content of such relations will be determined by the readiness of the alliance to take account of the interests of the Russian Federation when conducting military-political planning, and to respect the provisions of international law. (107)	The Russian Federation maintains its negative perspective towards NATO's expansion, the Alliance's military infrastructure approaching Russian borders, and its growing military activity in regions neighbouring Russia, viewing them as a violation of the principle of equal and indivisible security and leading to the deepening of old dividing lines in Europe and to the emergence of new ones. (70) Russia will build its relations with NATO, taking into account the degree to which the Alliance is ready to engage in equitable partnership, strictly adhere to the norms and principles of international law, take real steps towards a common state of peace, security and stability in the Euro-Atlantic region based on the principles of mutual trust, transparency and predictability, to ensure the compliance by all its members with the commitment undertaken within the Russia-NATO Council (…) (70)

TV SHOW REVIEW

Okkupert (2015)

(4.5/5)

By **Kevin M. Freese,** OE&TA



Okkupert (Occupied) is a Norwegian television series set in the near future exploring how a Russian occupation of Norway might unfold. It was created by Erik Skjoldbjærg, Karianne Lund, and Jo Nesbø and produced by TV2 Norge, Viaplay, and Yellow Bird. The show's dialogue is in Norwegian, English, and Russian. The first two seasons were filmed at multiple locations in Norway and were the most expensive Norwegian television series seasons ever filmed. The third and final season was filmed in Lithuania.

Central characters include Jesper Berg (Henrik Mestad), Prime Minister of Norway, Hans Djupvik (Eldar Skar), a Norwegian Police Security Services Officer assigned to the Prime Minister and later internal security, Hilde Djupvik (Selome Emnetu), a criminal judge, Bente Norum (Ane Dahl Torp), wife of investigative journalist who opens a restaurant catering to Russians, Irina Sidorova (Ingeborga Dapkunaite), the Russian Ambassador to Norway, and Anita Rygh (Janne Heltberg), the Prime Minister's chief political advisor.

The story is set in a notional near future in which the US has left NATO and climate change is having an exacerbating effect upon Norway. After Norwegian scientists develop a clean energy source using thorium, an environmentalist party is elected into power, vowing to divest Norway completely from fossil fuels and stop all oil mining and production in Norway. Soon after, Russian forces seize Norwegian oil facilities. At the same time, Prime Minister Jesper Berg is briefly kidnapped. He is soon freed, but during his capture he learns that neither the EU nor NATO are coming to Norway's assistance. The story is spread over an extended time period. Each episode takes place in a subsequent month, representing the culmination of several weeks' worth of activity.

As the series progresses, the Russian presence in Norway gradually grows in response to varied events that take place throughout Norway. Prime Minister Berg and his advisor Ms Rygh endeavor to persuade Russia to withdraw, desperately but fruitlessly seeking any form of international assistance while trying to balance the urgency of Russian departure with preventing the loss of life. The result is an administration that increasingly becomes a puppet state of Russia. Meanwhile, anti-Russian sentiment grows and eventually blossoms into a full-blown insurgency that involves Norwegians from all walks of life, including disaffected private citizens as well as government insiders. By the end of the second season, the political plot has become intricately complex, drawing in multiple international actors and governments.

As the plot develops, so do the principal characters. Berg transitions from a timid environmentalist to a shrewd resistance leader. Rygh grows from advisor to political figure herself. Hans Djupvik begins as a security guard and becomes the most powerful security official in the country. Hilde Djupvik begins as a minor court judge gradually becomes a fierce champion of justice. Norum grows from a struggling small business owner to insider with the Russian occupiers. Sidorova begins as a powerful if arrogant diplomat but grows in cynicism and insecurity. There are no real good guys or bad guys, except perhaps Norway itself. As the characters interact, they all transition from protagonist to antagonist in one way or another, each trying to do what he or she perceives as the right thing in their respective situations.

The timing of and scope of *Okkupert* eerily resembles events that unfolded in Ukraine in 2014. However, the show was more prophetic than deliberately analogous. According to show creator Erik Skjoldbjærg, filming of the show began the day Russia invaded Crimea. The story itself was inspired by other international events, notably the US-led invasion of Iraq in 2003. The story was originally conceived by writer Jo Nesbø in 2008, with other writers contributing over the years.

Okkupert is definitely a political show, not an action show. Most tactical actions are either inferred or depicted as quick, rapid events. However, the military and security theme predominates. The show very astutely presents the role of the military as an instrument of national power, cleverly employed alongside the other instruments. The scenario itself is a well-crafted example of conflict in an age of multi-domain operations. It depicts Russia competing for control of energy production resources, relying upon special operations rather than conventional forces, timing actions to support diplomatic and economic efforts, all supported by robust information operations. In doing so, *Okkupert* manages to portray Norwegian concerns about the potential existential threat posed by Russia while maintaining realism in how such a threat might unfold. If anything, it does too good a job; the depiction of Russia, combined with the coincidental timing, hit enough of a nerve to generate condemnation from the Russian government as Cold War reminiscent propaganda.

Okkupert has a lot to offer for the US Army training community, particularly in terms of scenario development. It shows how a near-peer competitor could pose a threat to a US ally through coordinated integration of all elements of national power, while managing to keep the conflict below the threshold of armed conflict. The portrayal of Russian activity is consistent with Russian strategic doctrine and recent, real-world examples. It is a decidedly Norwegian perspective on how things could happen, and how Norway should be paid attention, both as a NATO partner and a Russian neighbor. Whether season three will be as good remains to be seen, but if it even comes close to being as insightful as the first two seasons, it should also be a great success. ◆

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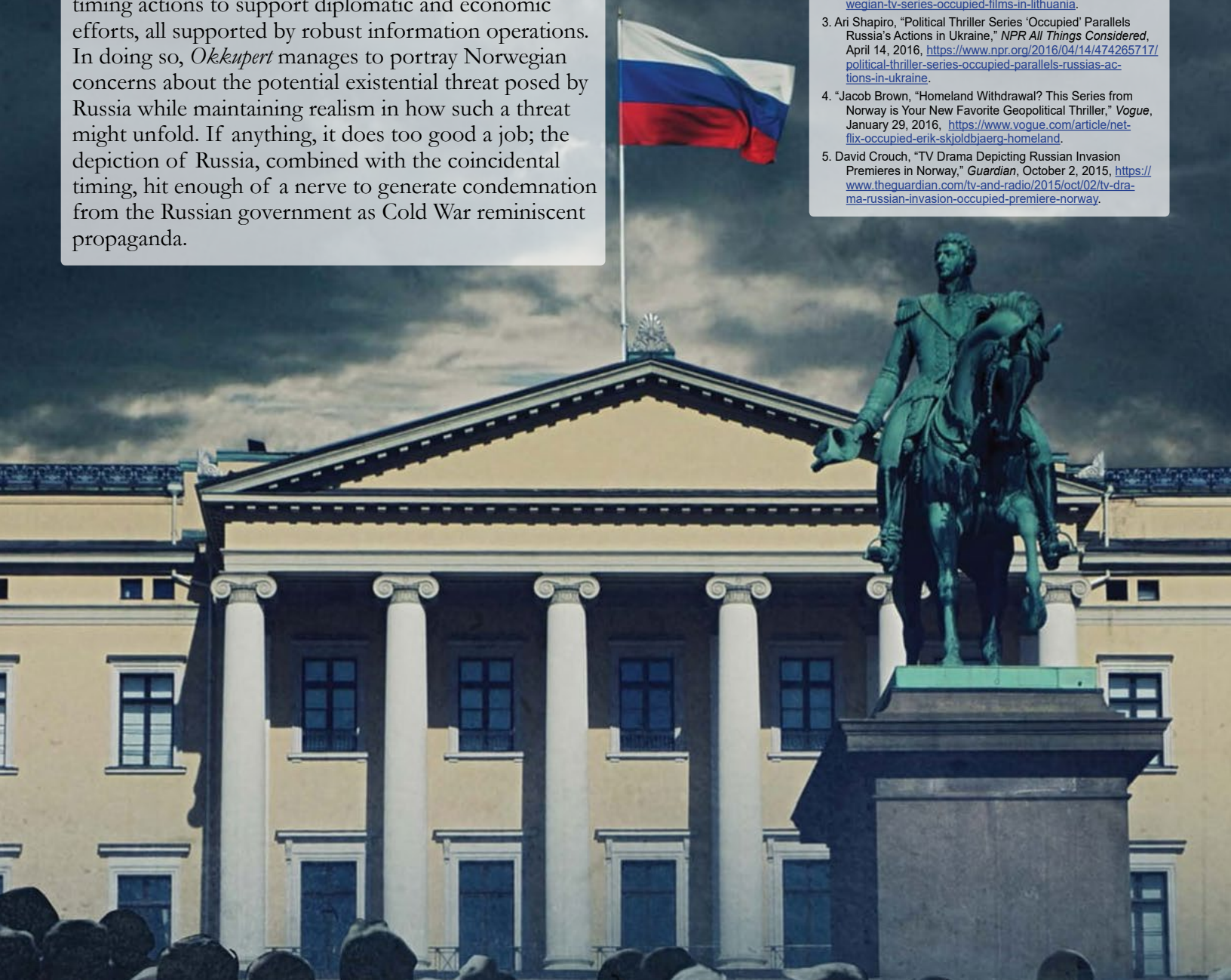

WORLDWIDE EQUIPMENT GUIDE (WEG) SHOWCASE

T-14 Armata Russian Main Battle Tank

Tanks and AT Vehicles > Tanks > Main Battle Tank > T-14 Armata Russian Main Battle Tank

Tiers:

1
2
3
4

Notes

The T-14 MBT can be a significant capability to Russia's tank fleet once a substantial number of T-14s appear in operational units. Although varied ways exist to classify tanks by characteristics of weight, roles, or main armament, current tank design descriptions sometimes blur terms, such as main battle tank versus medium tank. Overall size of a tank appears less important than developments to optimize technological advantages in automotive performance, weapon system lethality, and vehicle and crew survivability within a general category of main battle tank. The Armata chassis now presents the ability to apply major improvements to Russia's tank fleet that were previously constrained by the chassis and turret dimensions of the basic T-72 MBT design and those of its predecessors. Some of the most significant changes in the T-14 design, besides its visual dimensions, are—

- Unmanned turret with a 125mm main gun and autoloader of main gun ammunition from a cassette within the turret base, and a remotely-controlled weapon station (RCWS) on top of the turret that mounts one medium 7.62mm machine gun (there is no machine gun mounted coaxially to the main gun);
- Crew compartment capsule separated and protected from the turret and main gun ammunition to enhance crew survivability if turret area stored ammunition experiences a catastrophic explosion;
- Vehicle survivability armor appliques and active protection systems that improve the probability to defeat main gun, missile, large rocket-propelled grenade, and mine threats; and
- Improved automotive engineering, crew situational awareness systems, weapon system effectiveness, and digital command and fire control systems.

The larger dimensions of the T-14 allow for future design modifications as Russian requirements evolve and technology advances. Although some designers suggest a fully-robotic Armata vehicle could be considered in the future, or that a larger cannon or gun could be mounted to the Armata MBT, neither robotics nor a larger main weapon appear to be in the current program. Other capability claims have yet to be fully substantiated, such as radically-reduced emission signatures to diminish or negate infrared or thermal detection.

Source: The information provided above is from the January 2017 article titled "T-14 Gun-Missile Tank for the Russian Federation," by Jon H. Moilanen published in the TRADOC G-2 Red Diamond Threats Newsletter, Volume 8, Issue 01, January 2017.

System

Alternative Designation: T-14 Armata
Date of Introduction: 2015
Proliferation: The Russian Army initially planned to acquire 2,300 T-14s between 2015 and 2025.
Crew: 3 ea
Passenger Capacity: NA
Maximum Effective Range: 8,000 m
Meteorological Mast: Yes
Satellite Communications: Yes
Global Navigation Satellite System (GLONASS): Yes

Dimensions

Length: 8.7 m
Width: 3.5 m
Height: 3.3 m
Weight, Combat: 55 tons (sources range from 48 tons to 65 tons)
Ground Pressure: INA kg/m

Automotive

Engine Name: ChTZ 12N360 (A-85-3A)
Engine Type: Diesel
Engine Power: 1,500-2,000 hp
Power / Weight: 31 hp/t
Transmission: 12-speed automatic
Cruising Range: 500 km
Speed, Maximum Road: 80-90 km/h
Speed, Average Cross: INA
Speed Maximum Swim: Not Amphibious
Gradient: 60 %
Side Slope: 40 %
Vertical Step: 0.8 m
Trench: 2.8 m
Fording without Preparation: 1.2 m
Fording with Preparation: INA

Communications

Data-link and Radio Communications Antennae: Yes
Primary Tactical Radio: R-168 Akveduk
Note: It is anticipated that the T-14 Armata will have a modern suite of digital and FM communication capabilities.

Main Gun

Note: The T-14 is equipped with a unmanned Turret mounting a 125mm 2A82-1M smoothbore gun fed by an automatic loader. The turret carries a total of 45 rounds of ammunition, including ready-to-use ammunition.

System

Name: 2A82-1M (later versions may have the 2A83, 152mm cannon)
Type: Smoothbore Cannon
Caliber: 125 mm
Length: 7 m
Weight: 2,675 kg
Loader Type: Automatic Loader
Autoloader Basic Load: 32 ready-to-use rounds
Range Finder Type: Laser
Maximum Range: 8,000 m
Max Rate of Fire: 10-12 rds/min
Sustain Rate of Fire: INA

Main Gun *(continued)*

Ammunition (Option 1)

Name: 3VBM3/3BM9/10
Type: APFSDS
Caliber: 125 mm
Muzzle Velocity: 1,800 m/s
Basic Load: 45 rounds, 32 rounds in the autoloader
Effective Range: 3 km
Armor Penetration: 140 mm

Ammunition (Option 2)

Name: 9M119 Svir, 9M119M Refleks
Type: Laser beam ATGM
In Service: 1980 to present
Manufacturer: Degtyarev Plant
Mass: 17.2 kg
Diameter: 125 mm
Warhead Type: Tandem hollow-charge
Warhead Weight: 4.5 kg
Basic Load: 45 rounds, 32 rounds in the autoloader
Operational Range: 5,000 m
Guidance: Laser beam riding

Ammunition (Option 3)

Name: 3VBK7/3BK12
Type: HEAT-FS
Caliber: 125 mm
Muzzle Velocity: 950 m/s
Effective Firing Range: 4,000 m
Shell Weight: 29 kg
Projectile Weight: 19 kg
Basic Load: 45 rounds, 32 rounds in the autoloader
Charge Weight: 5 kg
Penetration: 220 mm

Ammunition (Option 4)

Name: 3VOF22/3OF19
Type: HE-Frag-FS
Round Weight: 33 kg
Muzzle Velocity: 850 m/s
Projectile Weight: 23 kg
Basic Load: 45 rounds, 32 rounds in the autoloader
Charge Weight: 3.4 kg

Auxiliary Weapon System #1

Note #1: The T-14 is equipped with a Remotely-Controled Weapon Station (RCWS)

System

Name: Kord 12.7mm Machine Gun
Type: 12.7mm
In Service: 1998-Present
Manufacturer: V.A. Degtyarev Plant
Variants: 6P50-1, 6P50-2, 6P50-3, 6P49
Length: 1,980 mm
Weight: 25.5 kg
Action: Gas-operated, rotating bolt
Rate of Fire: 650-750 rds/min
Effective Firing Range: 2,000 m
Feed System: 50-round linked belt
Sights: Iron Sights

Ammunition

Type: Armor Piercing
Caliber: 12.7 mm
Cartridge: 12.7×108mm
Muzzle Velocity: 860 m/s
Basic Load: 300 ea
Effective Range: 2,000 m
Maximum Effective Range vs Aircraft: 1,000 m
Maximum Effective Range vs Armor: 800 m
Maximum Effective Range vs Ground Targets: 2,000 m
Maximum Range: 7,850 m

Auxiliary Weapon System #2

Note #1: The T-14 is equipped with a Remotely-Controled Weapon Station (RCWS)

System

Name: 7.62mm PK (Kalashnikov's) Machine
Type: 7.62mm Machine Gun
Caliber: 7.62 mm
In Service: 1961-Present
Length: 1,203 mm
Barrel length: 605 mm
Weight: 9 kg
Max Rate of Fire: 800 rds/min
Sustain Rate of Fire: 250 rds/min
Action: Gas-operated, open bolt
Maximum Firing Range: 3,000 m
Effective Firing Range: 1,000 m
Feed System: Non-disintegrating metal 50 round belts in 100, 200, and 250 round boxes
Sights: Tangent iron sights (default); Optical, Night-vision, Thermal and Radar sights

Ammunition

Type: Ball
Caliber: 7.62 mm
Cartridge: 7.62×54mmR
Muzzle Velocity: 825 m/s
Basic Load: 1,000 rds/min
Effective Range: 1,500 m
Armor Penetration: INA
Maximum Firing Range: 4,000 m

Fire Control

Name: Kalina System
Computerized FCS: Yes
Thermal Sight Tank Commander: Yes
Thermal Sight Gunner: Yes
Main Gun Stabilization: Yes
Battle Field Management System: Yes
Laser Rangefinder: Yes
Cameras: Several cameras provide for a 360 degree visual coverage
Automatic Target Tracker: Yes

Protection

Hull Armor: 44S-sv-Sh: effective to 900mm vs Sabot and 1400mm vs HEAT.
Turret Armor: Lightly armored; relies on APS.
Applique Armor: Capable
Explosive Reactive Armor: Malachit dual ERA (4th Gen) can reduce penetration of APFSDS and HEAT rounds by 50%.
Active Protection System: Yes, Afghanit (similar to Israeli "Trophy"); NII Stali Upper Hemisphere Protection Complex; AESA radar slaved to the AA machine gun.
Mine Clearing: Yes, the T-14 has a active mine countermeasure system.
Self-Entrenching Blade: Yes
NBC Protection: Yes
Smoke Equipment: Yes
IR Signature: Can warn of electro-optical and infrared interrogation.
Note: There are reports that the T-14 will be equipped with STANAG 4569 Level 5 protection.

Variants

T-16 Armata BREM: Armored recovery version with the T-14 chassis. The standard turret of the T-14 is removed and replaced by a small, remotely operated, weapon station armed with a Kord 12.7mm caliber heavy machine gun. A crane is mounted on the right side on the top of the hull which is protected at the front with slat armor.

Worldwide Equipment Guide (WEG)

Equipment Added/Updated Tracker

September - November 2019

Number	Equipment Name	Country	Added	Updated
1	Pandur I Austrian 6x6 Armored Personnel Carrier (APC)	Austrailia	✓	
2	Pandur I-AM Austrian 6x6 Amphibious Armored Personnel Carrier (APC)	Austrailia	✓	
3	Pandur II Austrian 8x8 Amphibious Armored Personnel Carrier (APC)	Austrailia	✓	
4	Pak-IBMS (Rehbar) Pakistani Integrated Battlefield Management System	Belarus		✓
5	Optima-3 Belarusian GNSS Distributed Jamming Complex	Belarus		✓
6	EE-9 Cascavel Mark 4 Brazilian Armored Reconnaissance Vehicle	Brazil		✓
7	EE-9U Cascavel MX-8 Brazilian Armored Reconnaissance Vehicle	Brazil	✓	
8	GC-45 Canadian 155mm Towed Gun-Howitzer	Canada	✓	
9	DF-3 Chinese Surface to Surface Medium Range Ballistic Missile	China		✓
10	VN-11 Chinese Amphibious Infantry Fighting Vehicle (IFV)	China	✓	
11	VN-1 (ZBD-09) Chinese 8x8 Armor Personnel Carrier (APC)	China		✓
12	Z-8 (Zhishengji-8) Chinese Multi-Role Helicopter	China	✓	
13	Z-19 (WZ-19) Chinese Reconnaissance/Attack Helicopter	China		✓
14	Z-9 Harbin (WZ-9) Chinese Medium Multi-Role Helicopter	China		✓
15	YW-531H (Type 85) Chinese Amphibious Armored Personnel Carrier (APC)	China		✓
16	YW-534 (Type 89) Chinese Amphibious Armored Personnel Carrier (APC)	China		✓
17	DF-11 Chinese Surface to Surface Short Range Ballistic Missile	China		✓
18	DF-15 Chinese Surface to Surface Short Range Ballistic Missile	China		✓
19	Type 63A (ZTZ-63A) Chinese Amphibious Light Tank	China		✓
20	HQ-7B (FM-90) Chinese 6x6 Short-Range Air Defense Missile System	China		✓
21	LD 2000 (LuDun-2000) Chinese 8x8 Mobile Air Defense Gun Missile System	China		✓
22	LUYANG III Chinese Class DDG	China		✓
23	BM-1 Russian (Type 85, Chinese) 107mm Single Launch Surface to Surface Rocket System	China	✓	
24	AH-1/AH-1A Chinese 155mm Towed Artillery	China	✓	
25	AH-2 Chinese 155mm Towed Artillery	China	✓	
26	Type 15 Chinese Main Battle Tank (MBT)	China	✓	
27	GSL-130 Chinese Tracked Comprehensive Mine Clearing Vehicle (TCMCV)	China	✓	
28	GCZ-110 Chinese Tracked Multi-Purpose Engineer Vehicle (TMPEV)	China	✓	
29	GCZ-112 Chinese Tracked Multi-Purpose Engineer Vehicle (TMPEV)	China	✓	
30	Z-9 Harbin (WZ-9) Chinese Medium Multi-Role Helicopter	China		
31	HQ-7 (FM-80) Chinese Short-Range Air Defense Missile System	China	✓	
32	Type 63 Chinese 107mm Multiple Rocket Launcher	China		✓
33	SA 321 Super Frelon (Super Hornet) French Multi-Role Helicopter	France	✓	
34	AS532 Cougar (H215M) French Multipurpose Helicopter	France	✓	
35	EC725 Caracal (H225M Super Cougar) French long-Range Tactical Transport Helicopter	France	✓	
36	SA-341/342 Gazelle French Light Utility Helicopter	France	✓	
37	SA-342L Gazelle French Light Attack Helicopter	France	✓	
38	VAB French 4x4 Armored Personnel Carrier (APC)	France		✓
39	VAB French 4x4 Amphibious Armored Personnel Carrier (APC)	France		✓
40	SA-341/342 Gazelle French Light Helicopter	France		✓
41	Gepard German 35mm Self-Propelled Anti-Aircraft Gun	German		✓
42	Leopard 2 German Main Battle Tank	German		✓
43	Armbrust German 67mm Shoulder Fired Disposible Anti-Tank Missile Launcher	German		✓
44	Polyphem German and French Multi-Role Short Range Cruise Missile	Germany		✓
45	BO-105 German Light Utility Helicopter	Germany	✓	
46	EULe German Ground Based SIGINT Light Electronic Support System	Germany		✓
47	Leopard 2A German Main Battle Tank	Germany		✓
48	RESOLVE British Tactical Electronic Warfare Manpack System	Great Britain	✓	
49	FV101 Scorpion British Combat Reconnaissance Vehicle	Great Britain	✓	
50	FV101 Scorpion 90 British Combat Reconnaissance Vehicle	Great Britain	✓	
51	FV102 Striker British Anti-Tank Missile Carrier	Great Britain	✓	
52	FV103 Spartan British Armored Personnel Carrier (APC)	Great Britain	✓	
53	FV104 Samaritan British Armored Ambulance	Great Britain	✓	
54	FV105 Sultan British Command and Control Vehicle	Great Britain	✓	
55	FV106 Samson British Armored Recovery Vehicle	Great Britain	✓	
56	FV107 Scimitar British Armored Reconnaissance Vehicle	Great Britain	✓	
57	Shorland S55 British Armored Personnel Carrier (APC)	Great Britain		✓
58	FV101 Scorpion 90 British Amphibious Combat Reconnaissance Vehicle	Great Britain		✓
59	Panther V (BCC 67/VRQ 327) British Portable VHF Frequency Hopping Secure EPM Radio	Great Britain	✓	
60	Panther V (BCC 67/VRQ 327) British Vehicle-Mounted VHF Frequency Hopping Secure EPM Radio	Great Britain	✓	
61	Meerkat-SA British Electronic Support Measures (ESM) and Electronic Intelligence (ELINT) System	Great Britain	✓	
62	FEG AK-63/AMM Hungarian 7.62mm Assault Rifle	Hungary	✓	
63	BrahMos Indian / Russian Multi-Role Short Range Cruise Missile	India		✓

Continued on next page...

Worldwide Equipment Guide (WEG)

Equipment Added/Updated Tracker *(continued)*

September - November 2019

Number	Equipment Name	Country	Added	Updated
64	BrahMos II Indian / Russian Multi-Role Short Range Cruise Missile	India		✓
65	Tondar-69 Iranian Surface to Surface Short Range Ballistic Missile	Iran		✓
66	Shahab-3A Iranian Medium Surface to Surface Medium Range Ballistic Missile	Iran		✓
67	Shahab-3B Iranian Medium Surface to Surface Medium Range Ballistic Missile	Iran		✓
68	2S1 (Gvozdika) Iranian 122mm Self-Propelled Howitzer (SPH)	Iran	✓	
69	Raad-2 (Thunder 2) Iranian 155mm Self-Propelled Artillery	Iran	✓	
70	Raad-2M Iranian 155mm Self-Propelled Howitzer (SPH)	Iran	✓	
71	Karrar Iranian Main Battle Tank (MBT)	Iran	✓	
72	Chieftain MK 3 Iranian Main Battle Tank (MBT)	Iran	✓	
73	Zulfiqar-1 Iranian Main Battle Tank (MBT)	Iran	✓	
74	Zulfiqar-2 Iranian Main Battle Tank (MBT)	Iran	✓	
75	Zulfiqar-3 Iranian Main Battle Tank (MBT)	Iran	✓	
76	M110 Iranian 203mm Self-Propelled Howitzer (SPH)	Iran	✓	
77	M107 Iranian 175mm Self-Propelled Gun (SPG)	Iran	✓	
78	BMP-1 Iranian Amphibious Infantry Fighting Vehicle (IFV)	Iran		✓
79	BMP-2 Iranian Amphibious Infantry Fighting Vehicle (IFV)	Iran		✓
80	SA-5 Gammon (S-200 Vega) Iranian Surface-to-Air Missile (SAM) System	Iran	✓	
81	SA-20C (S-300PMU-2) Iranian Long Range Air Defense Missile System	Iran	✓	
82	Ra'ad (Thunder) Iranian Surface-to-Air Missile (SAM) System	Iran	✓	
83	Khordad-3 Iranian Surface-to-Air Missile (SAM) System	Iran	✓	
84	9K330 Tor (SA-15 Gauntlet) Iranian Short-Range Surface-to-Air Missile (SAM) System	Iran	✓	
85	Fateh-110 Iranian Surface-to-Surface Short-Range Ballistic Missile (SRBM)	Iran	✓	
86	CSA-41 (FM-80) Iranian Short-Range Air Defense Missile System	Iran	✓	
87	Naze'at 10-H Iranian Long-Range Artillery Rocket	Iran	✓	
88	Naze'at 6-H Iranian Long-Range Artillery Rocket	Iran	✓	
89	9K35M Strela-10M (SA-13 Gopher) Iranian Short-Range Surface-to-Air Missile (SAM) System	Iran	✓	
90	Fadjr-5 Iranian 333 mm Long-Range Multiple Launch Rocket System (MLRS)	Iran	✓	
91	Fadjr-3 Iranian 240 mm Intermediate-Range Multiple Launch Rocket System (MLRS)	Iran	✓	
92	BM-21 Grad Iranian 122mm Multiple Rocket Launcher (MRL)	Iran	✓	
93	M115 Iranian 203mm Towed Howitzer	Iran	✓	
94	Hadid HM20 Iranian 122mm Multiple Rocket Launcher (MRL)	Iran	✓	
95	GHN-45 Iranian 155mm Towed Gun-Howitzer	Iran	✓	
96	M-46 Iranian 130mm Towed Gun	Iran	✓	
97	D-20 Iranian 152mm Towed Gun-Howitzer	Iran	✓	
98	M114A1 Iranian 155mm Towed Howitzer	Iran	✓	
99	D-30 Iranian 122mm Towed Gun Howitzer	Iran	✓	
100	Type 63 Iranian 107mm Multiple Rocket Launcher (MRL)	Iran	✓	
101	Oerlikon GDF-001 Iranian 35mm Towed Anti-Aircraft Gun	Iran	✓	
102	Toophan (BGM-71A TOW) Iranian Anti-Tank Guided Missile (ATGM)	Iran	✓	
103	EE-9 Cascavel Mark 3 Iranian Armored Reconnaissance Vehicle	Iran	✓	
104	Sayyad Iranian Multi-Purpose Armored Vehicle	Iran	✓	
105	FV101-EX Scorpion Iranian Combat Reconnaissance Vehicle	Iran	✓	
106	M113A1-EX Iranian Armored Personnel Carrier (APC)	Iran	✓	
107	BTR-50-EX Iranian Armored Personnel Carrier (APC)	Iran	✓	
108	BTR-60-EX Iranian Armored Personnel Carrier (APC)	Iran	✓	
109	Panha 2091 (Toufan I) Iranian Attack Helicopter	Iran	✓	
110	Shahed-129 Iranian Medium-Altitude Long-Endurance Unmanned Combat Aerial Vehicle (UCAV)	Iran	✓	
111	Mohajer-1 Iranian Tactical Unmanned Aerial Vehicle (UAV)	Iran	✓	
112	Mohajer-2 Iranian Tactical Unmanned Aerial Vehicle (UAV)	Iran	✓	
113	Mohajer-2N Iranian Unmanned Aerial Vehicle (UAV)	Iran	✓	
114	Mohajer-3 (Dorna) Iranian Tactical Unmanned Aerial Vehicle (UAV)	Iran	✓	
115	Mohajer-4 (Hodhod) Iranian Tactical Unmanned Aerial Vehicle (UAV)	Iran	✓	
116	Mohajer-6 Iranian ISTAR Unmanned Aerial Vehicle (UAV)	Iran	✓	
117	Ababil-2 Iranian Tactical Unmanned Aerial Vehicle (UAV)	Iran	✓	
118	AT-5 Towsan Iranian Anti-Tank Guided Missile (ATGM)	Iran		✓
119	9M14 Malyutka (AT-3 Sagger) Iranian Anti-Tank Guided Missile (ATGM)	Iran	✓	
120	RPG-29-EX (Vampir) Iranian 105mm Rocket-Propelled Grenade (RPG) Launcher	Iran	✓	
121	Fateh-110 Iranian Surface to Surface Short Range Ballistic Missile	Iran		✓
122	Sayyad Iranian Multi-Purpose Armored Vehicle	Iran		✓
123	SA-5 Gammon (S-200 Vega) Iranian Surface-to-Air Missile (SAM) System	Iran		✓
124	9K330 Tor (SA-15 Gauntlet) Iranian Short-Range Surface-to-Air Missile (SAM) System	Iran		✓
125	CSA-41 (FM-80) Iranian Short-Range Air Defense Missile System	Iran		✓
126	Zulfiqar 3 Iranian Main Battle Tank	Iran		✓

Continued on next page...

Worldwide Equipment Guide (WEG)

Equipment Added/Updated Tracker *(continued)*

September - November 2019

Number	Equipment Name	Country	Added	Updated
127	BTR-50 (Export) Iranian Amphibious Armored Personnel Carrier (APC)	Iran		✓
128	Sayyad-1 (SA-2 Guideline) Iranian Strategic Surface-to-Air (SAM) System	Iran		✓
129	MP-DF 100 Israeli Manpack DF/COMINT System	Israel	✓	
130	IAI Searcher Mk II Israeli Reconnaissance Unmanned Aerial Vehicle (UAV)	Israel	✓	
131	IAI Searcher Mk I Israeli Reconnaissance Unmanned Aerial Vehicle (UAV)	Israel	✓	
132	IAI Searcher Mk III Israeli Reconnaissance Unmanned Aerial Vehicle (UAV)	Israel	✓	
133	VTT-323 Korean 107mm Multiple Rocket Launcher (MRL)	North Korea	✓	
134	VTT-323 (M1973) North Korean Amphibious Armored Personnel Carrier (APC)	North Korea		✓
135	NoDong-1 Noth Korean Surface to Surface Medium Range Ballistic Missile	North Korea		✓
136	R-330Zh Zhitel, Russian Cellular Jamming and Direction Finding System	Russia	✓	
137	Tipchak, Russian UAV	Russia	✓	
138	T-14 Armata Russian Main Battle Tank	Russia	✓	
139	S-500 Russian Air Defense Artillery System	Russia	✓	
140	BMPT, Terminator Russian Armored Fighting Vehicle	Russia	✓	
141	Nerehta Russian Armed Unmanned Ground Vehicle (AUGV)	Russia	✓	
142	Kurganets-25 Russian Tracked Armored Personnel Carrier (APC)	Russia	✓	
143	Kurganets-25 Russian Tracked Infantry Fighting Vehicle (IFV)	Russia	✓	
144	K-17 Bumerang Russian 8x8 Wheeled Infantry Fighting Vehicle (IFV)	Russia	✓	
145	K-16 Bumerang Russian 8x8 Wheeled Armored Personnel Carrier (APC)	Russia	✓	
146	RS-28 Sarmat Russian Intercontinental Ballistic Missile (ICBM)	Russia	✓	
147	3M22 Russian Cruise Missile	Russia	✓	
148	Kh-47M2 Kinzhal (Dagger) Russian Cruise Missile	Russia	✓	
149	9M730 Burevestnik (Storm Petrel) Russian Nuclear Powered Cruise Missile	Russia	✓	
150	Poseidon Russian Underwater Unmanned Vehicle	Russia	✓	
151	Peresvet Russian Air and Missile Defense Laser	Russia	✓	
152	SSC-8 (9M728) Russian Ground Launched Cruise Missile	Russia	✓	
153	Kh-101 / Kh-102 Russian Air Launched Cruise Missile	Russia	✓	
154	SS-N-27 Sizzler Russian Multi-Purpose Cruise Missile	Russia	✓	
155	SS-N-26 Strobile Russian Anti-Ship Short Range Cruise Missile	Russia	✓	
156	SS-N-30A Kalibr Russian Multi-Role Long Range Cruise Missile	Russia	✓	
157	Kh-55 Russian Multi-Role Long Range Cruise Missile	Russia	✓	
158	9M14 Malyutka Russian MCLOS Wire-Guided Anti-Tank Guided Missile (ATGM)	Russia	✓	
159	BMP-1 Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia		✓
160	BMP-1P Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia		✓
161	9K111 Fagot Russian SACLOS Wire-Guided Anti-Tank Missile (ATGM)	Russia	✓	
162	BMP-1D Russian Infantry Fighting Vehicle (IFV)	Russia	✓	
163	BMP-2 Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia		✓
164	BMP-2M Berezhok Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia		✓
165	9M133 Kornet (AT-14 Spriggan) Russian Man-Portable Anti-Tank Guided Missile (ATGM)	Russia	✓	
166	BMP-2K Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia	✓	
167	BMP-3 Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia		✓
168	9K116-1 Bastion (AT-10) Russian Anti-Tank Guided Missile (ATGM)	Russia	✓	
169	BMP-3M Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia		✓
170	BMP-3K Russian Amphibious Infantry Fighting Vehicle (IFV)	Russia	✓	
171	GAZ-2330 Tigr Russian Light Utility Vehicle	Russia	✓	
172	PKP Pecheneg Russian 7.62mm General Purpose Machine Gun	Russia	✓	
173	GAZ-2975 Tigr Russian Light Utility Vehicle	Russia	✓	
174	2S7 Pion Russian 203mm Self-Propelled Gun (SPG)	Russia	✓	
175	T-72A Russian Main Battle Tank (MBT)	Russia	✓	
176	T-72B Russian Main Battle Tank (MBT)	Russia	✓	
177	T-72AK Russian Main Battle Tank (MBT)	Russia	✓	
178	T-72BM Russian Main Battle Tank (MBT)	Russia	✓	
179	T-72B3 Russian Main Battle Tank (MBT)	Russia	✓	
180	2S34 Hosta/Chosta Russian 120mm Self-Propelled Mortar (SPM)	Russia	✓	
181	BMD-4 Russian Airborne Amphibious Infantry Fighting Vehicle (IFV)	Russia	✓	
182	ZSU-23-4 Shilka Russian 23-mm Self-Propelled Gun (SPG)	Russia	✓	
183	9K720 Iskander (SS-26 Stone) Russian Ballistic Missile and Cruise Missile Launcher	Russia	✓	
184	OTR-21 Tochka (SS-21 Scarab) Russian Tactical Ballistic Missile System	Russia	✓	
185	S-400 Triumph (SA-21 Growler) Russian Long-Range Surface-to-air Missile System	Russia		✓
186	S-300PMU-1 (SA-20 Gargoyle) Russian Long Range Surface-to-air Missile System	Russia		✓
187	9K317M Buk-M3 (SA-X-27) Russian Medium-Range Air Defense Missile System	Russia	✓	
188	Buk-M2 (SA-17 Grizzly) Russian Medium-Range Air Defense Missile System	Russia	✓	
189	BM-30 Smerch Russian 300mm Multiple Launch Rocket System	Russia	✓	

Continued on next page...

Worldwide Equipment Guide (WEG)

Equipment Added/Updated Tracker *(continued)*

September - November 2019

Number	Equipment Name	Country	Added	Updated
190	Tor (SA-15) Russian Short-Range Air Defense System	Russia	✓	
191	Strela-10 (SA-13 Gopher) Russian Short-Range Air Defense Missile System	Russia	✓	
192	BM-27 Uragan Russian 220mm Multiple Launch Rocket System	Russia	✓	
193	9A52-4 Tornado Russian Multiple Launch Rocket System	Russia	✓	
194	BM-21 Grad Russian 122mm Multiple Launch Rocket System	Russia	✓	
195	TOS-1 Buratino Russian 220mm Heavy Flamethrower System	Russia	✓	
196	TOS-1A Solntsepek Russian 220mm Heavy Flamethrower System	Russia	✓	
197	Uragan-1M (Hurricane-1M) Russian 220mm/300mm Multiple Launch Rocket System	Russia	✓	
198	2A65 Msta-B Russian 152mm Towed Gun Howitzer	Russia		✓
199	D-30 Russian 122mm Towed Gun Howitzer	Russia		✓
200	2B16 Nona-K Russian 120mm Towed Combination Gun	Russia	✓	
201	BTR-80 Russian Armored Personnel Carrier (APC)	Russia	✓	
202	KPV-14.5 Russian Heavy Machine Gun	Russia	✓	
203	BTR-80A Russian Armored Personnel Carrier (APC)	Russia		✓
204	BTR-82 Russian Armored Personnel Carrier (APC)	Russia	✓	
205	RPM-2 Russian CBRN Reconnaissance Vehicle	Russia	✓	
206	RKhM-6 Povozka Russian CBRN Reconnaissance Vehicle	Russia	✓	
207	RKhM-4 Russian CBRN Reconnaissance Vehicle	Russia	✓	
208	BTR-60 Russian Armored Personnel Carrier (APC)	Russia		✓
209	BRDM-2 Russian Amphibious Scout Car	Russia	✓	
210	BTR-60-R-145BM Russian Command Post and Communication Center Vehicle	Russia	✓	
211	Ural-4320 Russian General Utility Truck	Russia	✓	
212	Ural-43206 Russian 4x4 General Utility Truck	Russia	✓	
213	BMR-3M Russian Mine Clearing Vehicle	Russia	✓	
214	GMZ-3 Russian Tracked Minelaying Vehicle	Russia	✓	
215	IMR-2 Russian Combat Engineering Vehicle	Russia	✓	
216	1L269 Krasukha-2 Russian Broadband Multifunctional Jamming Station	Russia	✓	
217	1RL257 Krasukha-4 Russian Broadband Multifunctional Jamming Station	Russia	✓	
218	Moskva-1 (1L265) Russian Electronic Warfare Vehicle	Russia	✓	
219	Mi-24/Mi-35 Hind Russian Attack Helicopter	Russia	✓	
220	S-5M (ARS-57) Russian 55mm Rocket	Russia	✓	
221	UB-32 Russian 57mm Reusable, 32-salvo Rocket Pod	Russia	✓	
222	Mil Mi-28 Havoc Russian Attack Helicopter	Russia	✓	
223	Mil Mi-8 Hip Russian Medium Transport Helicopter	Russia		✓
224	Eleron-3 Russian Reconnaissance Unmanned Aerial Vehicle (UAV)	Russia		✓
225	Forposts Russian Reconnaissance Unmanned Aerial Vehicle (UAV)	Russia	✓	
226	Orlan-10 Russian Unmanned Aerial Vehicle (UAV)	Russia		✓
227	T-72S (Shilden) Russian Main Battle Tank (MBT)	Russia	✓	
228	S-75 (SA-2 Guideline) Russian Strategic SAM System	Russia	✓	
229	SA-5 Gammon (S-200 Volga) Russian Surface-to-Air Missile (SAM) System	Russia	✓	
230	MIM-23B Shahin Iranian Surface-to-Air Missile (SAM) System	Russia	✓	
231	SA-20 Gargoyle (S-300PMU-1) Russian Surface-to-Air Missile (SAM) System	Russia	✓	
232	MAZ-537 Russian 8x8 Special Wheeled Chassis	Russia		✓
233	SA-20B Favorit (S-300PMU-2) Russian Long Range Air Defense Missile System	Russia	✓	
234	Tor (SA-15 Gauntlet) Russian Short-Range Surface-to-Air Missile (SAM) System	Russia	✓	
235	Pantsir-S1 (SA-22 Greyhound) Russian Short-Range Air Defense Gun/Missile System	Russia		✓
236	Scud-C Russian Surface to Surface Short Range Ballistic Missile	Russia		✓
237	SA-13 Gopher (9K35 Strela-10) Russian Short-Range Surface-to-Air Missile (SAM) System	Russia	✓	
238	M115 Russian 203mm Towed Howitzer	Russia	✓	
239	M-46 Russian 130mm Towed Gun	Russia		✓
240	D-20 Russian 152mm Towed Gun-Howitzer	Russia		✓
241	BTR-50 Russian Armored Personnel Carrier (APC)	Russia		✓
242	9M133 Kornet (AT-14 Spriggan) Russian Man-Portable Anti-Tank Guided Missile (ATGM)	Russia		✓
243	9K32 Strela-2 (SA-7 Grail) Russian Man Portable Surface-to-Air Missile (MANPAD)	Russia	✓	
244	9K388 Igla-S (SA-24 Grinch) Russian Man-Portable Air-Defense Missile System (MANPADS)	Russia	✓	
245	9K38 Igla (SA18 Grouse) Russian Man-Portable Air-Defense Missile System (MANPADS)	Russia	✓	
246	Misagh-2 Russian Man Portable Air-Defense Missile System (MANPADS)	Russia	✓	
247	9M14 Malyutka (AT-3 Sagger) Russian Anti-Tank Guided Missile (ATGM)	Russia		✓
248	RPG-29 (Vampir) Russian 105-mm Rocket-Propelled Grenade (RPG) Launcher	Russia		✓
249	Mil Mi-28 (Havoc) Russian Attack Helicopter	Russia		✓
250	Ka-50 Black Shark (Hokum A) Russian Attack Helicopter	Russia	✓	
251	Ka-52 Alligator (Hokum B) Russian Attack Helicopter	Russia	✓	
252	Mil Mi-28 (Havoc) Russian Attack Helicopter	Russia		✓

Continued on next page...

Worldwide Equipment Guide (WEG)

Equipment Added/Updated Tracker *(continued)*

September - November 2019

Number	Equipment Name	Country	Added	Updated
253	Mil Mi-2 Hoplite Russian Transport Helicopter	Russia	✓	
254	Mil Mi-8T (Hip-C) Russian Medium Transport Helicopter	Russia	✓	
255	Mil Mi-17 (Hip H) Russian Medium Transport Helicopter	Russia	✓	
256	Ka-27 Helix Russian Anti-Submarine Helicopter	Russia	✓	
257	Mil Mi-6 (Hook) Russian Heavy Transport Helicopter	Russia		✓
258	Mil Mi-26 (Halo) Russian Heavy Transport Helicopter	Russia		✓
259	Mil Mi-26T2 Russian Heavy Transport Helicopter	Russia	✓	
260	BTR-70 Russian Amphibious Armored Personnel Carrier (APC)	Russia		✓
261	BTR-152 Russian Armored Personnel Carrier (APC)	Russia		✓
262	SG-43 Goryunov Russian 7.62mm Medium Machine Gun	Russia	✓	
263	BTR-T Russian Heavy Armored Personnel Carrier (APC)	Russia	✓	
264	9K113 Konkurs (AT-5 Spandrel) Russian Ant-Tank Guided Missile	Russia	✓	
265	BTR-87 Russian 8x8 Armored Personnel Carrier (APC)	Russia		✓
266	BTR-90 (GAZ-5923) Russian 8x8 Armored Personnel Carrier (APC)	Russia		✓
267	ASG-17 Plamya Russian 30mm Automatic Grenade Launcher	Russia	✓	
268	BTR-D Russian Airborne Armored Personnel Carrier (APC)	Russia	✓	
269	BTR-ZD Russian Airborne 23mm Self-Propelled Anti-Aircraft Gun	Russia	✓	
270	BTR-80 Russian 8x8 Amphibious Armored Personnel Carrier (APC)	Russia		✓
271	BTR-82A Russian 8x8 Amphibious Armored Personnel Carrier (APC)	Russia		✓
272	BTR-50 Russian Amphibious Armored Personnel Carrier (APC)	Russia		✓
273	BTR-40 Russian 4x4 Armored Personnel Carrier (APC)	Russia		✓
274	BRM-1K Russian Amphibious Combat Reconnaissance Vehicle (CRV)	Russia		✓
275	BRM-1 Russia Amphibious Combat Reconnaissance Vehicle (CRV)	Russia	✓	
276	9M337 Sosna-R (SA-24) Russian Short-Range Air Defense Missile System	Russia	✓	
277	BRM-3K Rys Russian Amphibious Combat Reconnaissance Vehicle (CRV)	Russia		✓
278	R-149BMR Russian 8x8 Amphibious Armored Command and Signal Vehicle	Russia	✓	
279	Andromeda-D Russian Automated Command and Control (C2) System	Russia	✓	
280	R-168-0,1U(M)E Russian VHF Handheld Radio Station	Russia	✓	
281	R-168-5UN(1)E Russian VHF Manpack-Vehicular Radio Station	Russia	✓	
282	R-168-100U-2 Russian Mobile VHF Radio Station	Russia	✓	
283	R-168-100KA Russian Vehicle Mounted HF Radio Station	Russia	✓	
284	R-438M Belozer Russian Mobile Satellite Communication Station	Russia	✓	
285	KamAZ-5350 Russian 6x6 General Utility Truck	Russia	✓	
286	R-149AKSh-1 Russian 6x6 Command and Signal Vehicle	Russia	✓	
287	R-1685KVE Russian Vehicle-Mounted HF Radio Set	Russia	✓	
288	R-163-50K Russian Mobile HR Telephone and Telegraph Radio	Russia	✓	
289	R-149MA3 Russian 8x8 Amphibious Command and Signal Armored Personnel Carrier (APC)	Russia	✓	
290	Akatsiya-M ASU Russian Automated Command and Control System	Russia	✓	
291	URAL-375D Russian 6X6 General Utility Truck	Russia		✓
292	9S52 Polyana-D4 ASU Russian Air Defense Command and Control System	Russia	✓	
293	Kvant 1L222 Avtobaza Russian 6x6 Electronic Support (ES) Electronic Intelligence (ELINT) System	Russia		✓
294	1V152 FIST Kapustnik-B Russian 8x8 Amphibious Command and Forward Observer Vehicle	Russia	✓	
295	1V152 FDC Kapustnik-B Russian 8x8 Amphibious Command and Fire Control Vehicle	Russia	✓	
296	KamAZ-6350 Russian 8x8 Heavy Utility Truck	Russia	✓	
297	1L269 Krasukha-2 Russian 8x8 Mobile Electronic Warfare System	Russia	✓	
298	BAZ-6909 Russian 8x8 Special Wheeled Chassis	Russia	✓	
299	1L269 Krasukha-4 Russian 8x8 Mobile Electronic Warfare System	Russia	✓	
300	Borisoglebsk-2 Russian Multi-Functional Electronic Warfare (EW) Weapon System	Russia	✓	
301	GAZ Tigr-M Russian 4x4 Multipurpose Armored Vehicle	Russia	✓	
302	Kord 6P50 Russian 12.7mm Heavy Machine Gun	Russia	✓	
303	Leer 2 Russian 4x4 Mobile Electronic Warfare (EW) Vehicle	Russia	✓	
304	2A45 Sprut-A Russian 125mm Towed Anti-Tank Gun	Russia	✓	
305	2A45M Sprut-B Russian 125mm Self-Propelled Towed Gun	Russia	✓	
306	R-142 NSA Russian 6x6 Command and Control Vehicle	Russia		✓
307	Rtut-BM 1L262E (Mercury) Russian Mobile Electronic Defense Station	Russia		✓
308	Groza R-934UM2 Russian 6x6 HF/VHF Electronic Warfare (EW) System	Russia	✓	
309	PSNR-8 Kredo-M1 Russian Portable Ground Surveillance Radar System	Russia	✓	
310	P-40 (Long Track) Russian Mobile 3-D UHF Radar System	Russia	✓	
311	Kasta 2E2 Russian 6x6 Low-Altitude All-Around 3-D Surveillance Radar System	Russia		✓
312	Kasta 2E1 Russian 6x6 Low-Altitude All-Around 3-D Surveillance Radar System	Russia	✓	
313	BRDM-1 Russian 4x4 Amphibious Armored Scout Car	Russia		✓
314	ZPU-4 Russian 14.5-mm Towed Anti-Aircraft Gun	Russia		✓
315	ZU-23-2 Russian 23-mm Towed Anti-Aircraft Gun	Russia		✓

Continued on next page...

Worldwide Equipment Guide (WEG)

Equipment Added/Updated Tracker *(continued)*

September - November 2019

Number	Equipment Name	Country	Added	Updated
316	M-1939 (61-K) Russian 37mm Towed Anti-Aircraft Gun	Russia		✓
317	9K310 Igla-1 (SA-16 Gimlet) Russian Man-Portable Infrared Homing Surface-to-Air Missile	Russia	✓	
318	S-300P (SA-10 Grumble) Russian 8x8 Long Range Surface-to-Air Missile System	Russia		✓
319	OTR-21 Tochka (Scarab-B) Russian Surface to Surface Close Range Ballistic Missile	Russia		✓
320	Buk-M2 (SA-17 Grizzly) Russian Medium Range Air Defense Missile System	Russia		✓
321	Buk-M3 (SA-X-27) Russian Medium Range Air Defense Missile System	Russia		✓
322	Iskander Russian Surface to Surface Short Range Ballistic Missile	Russia		✓
323	Scud-C Russian Surface to Surface Short Range Ballistic Missile	Russia		✓
324	MAZ-7910 Russian 8x8 Air Defense Missile System Carrier	Russia	✓	
325	30N6 Flap Lid Russian Ground-Based Target Acquisition and Tracking Radar	Russia	✓	
326	76N6 Clam Shell Russian Low Altitude Acquisition Radar	Russia	✓	
327	64N6 Big Bird Russian Surveillance and Target Acquisition Radar	Russia	✓	
328	9K31 Strela-1 (SA-9 Gaskin) Russian 4x4 Infrared Guided Surface-to-Air Missile System	Russia		✓
329	Tor (SA-15 Gauntlet) Russian Short-Range Surface-to-Air Missile (SAM) System	Russia		✓
330	30N6E2 (Tombstone) Russian 3-D Long-Range Surveillance Radar	Russia	✓	
331	96L6E (Cheese Board) Russian Early-Warning and Acquisition Radar	Russia	✓	
332	MAZ-543 Russian 8x8 Special Wheeled Chassis	Russia	✓	
333	MT-T Russian Heavy Tracked Cargo Carrier	Russia	✓	
334	S-300V (SA-12s Gladiator) Russian Long-Range Air Defense Missile System	Russia	✓	
335	S-300V (SA-12b Giant) Russian Long-Range Air Defense Missile System	Russia	✓	
336	9S15 Billboard (9S15M Obzor 3) Russian 3D Surveillance Radar System	Russia	✓	
337	9S19 High Screen (9S19M Imbir) Russian Long-Range Sector Surveillance Radar System	Russia	✓	
338	9S32 Grill Pan Russian Fire Control Radar System	Russia	✓	
339	ZSU-57-2 (Ob'yekt 500) Russian 57mm Self-Propelled Anti-Aircraft Gun	Russia		✓
340	2K11 Krug (SA-4 Ganef) Russian Medium-Range Surface-to-Air Missile (SAM) System	Russia	✓	
341	AK-12 Russian 5.45 x 39mm Assault Rifle	Russia		✓
342	BM-27 Uragan Russian 220mm MLRS	Russia		✓
343	2S6M1 Tunguska Russian 30mm SP AA Gun & Missile System	Russia		✓
344	RKhM-2 Russian CBRN Recon Vehicle	Russia		✓
345	ZSU-57-2 Russian Self Propelled Air Defense Artillery Gun	Russia		✓
346	IMR-2M Russian Obstacle Clearing Vehicle	Russia		✓
347	9P162 KORNET LR Russian ATGM Launcher Vehicle	Russia		✓
348	9A51 Prima Russian 122mm MLRS	Russia		✓
349	QBZ-95 Chinese 8x42mm Bullpup Assault Rifle	Russia		✓
350	PMP Russian Heavy Folding Pontoon Bridge	Russia		✓
351	AK-47 Russian 7.62x39mm Assault Rifle	Russia		✓
352	T-80B Russian Main Battle Tank	Russia		✓
353	2B11 Russian 120-mm Towed Mortar	Russia		✓
354	BOV M11 Serbian 4x4 Armored Reconnaissance Vehicle	Serbia	✓	
355	BOV-M Slovenian 4x4 Armored Personnel Carrier (APC)	Slovenia		✓
356	BOV-1/POLO M-83 Slovenia 4x4 Armored Personnel Carrier (APC)	Slovenia	✓	
357	BOV-3 Slovenian 20mm Self-Propelled Anti-Aircraft Vehicle	Slovenia	✓	
358	URO VAMTAC ST5 BN3 Spanish 4x4 High-Mobility Tactical Vehicle	Spain	✓	
359	URO VAMTAC Spanish 4x4 High-Mobility Tactical Vehicle	Spain	✓	
360	EIMOS-81 Spanish 81mm Self-Propelled Integrated Mortar System	Spain	✓	
361	EIMOS-60 Spanish 60mm Self-Propelled Integrated Mortar System	Spain	✓	
362	AT-4 Swedish 84mm Single-Use Anti-Tank Recoilless Rifle	Sweden	✓	
363	Giraffe 50AT Swedish Air Defense Radar System	Sweden	✓	
364	Pz 87 (Panzer 87) Swiss Main Battle Tank	Switerland		✓
365	Oerlikon GDF Switzerland 35mm Towed Anti-Aircraft Gun	Switterland	✓	
366	HC-2423 Swiss Secure GSM Telephone	Switzerland		✓
367	Oerlikon GDF Swiss 35mm Towed Anti-Aircraft Gun with Skyguard Radar	Switzerland		✓
368	DFINT-3T2 Turkish Transportable Direction Finding (DF) System	Turkey	✓	
369	Cobra Turkish 4x4 Amphibious Armored Personnel Carrier (APC)	Turkey		✓
370	Cobra II Turkish 4x4 Amphibious Armored Personnel Carrier (APC)	Turkey	✓	
371	DFINT-3T2 Turkish Transportable Direction Finding (DF) System	Turkey	✓	
372	BMP-3 UAE Amphibious Infantry Fighting Vehicle (IFV)	UAE		✓
373	Kolchuga-M Ukrainian Electronic Warfare (EW) Support System	Ukrainian		✓
374	Warrior United Kingdom Infantry Fighting Vehicle (IFV)	United Kingdom		✓
375	VROD/VMAX American Versatile Radio Observation and Direction System	USA	✓	
376	M2 Browning American .50 Caliber Heavy Machine Gun	USA		✓
377	M110 American 203mm Self-Propelled Howitzer (SPH)	USA	✓	
378	M110A1 American 203mm Self-Propelled Howitzer (SPH)	USA	✓	

Continued on next page...

Worldwide Equipment Guide (WEG)

Equipment Added/Updated Tracker *(continued)*

September - November 2019

Number	Equipment Name	Country	Added	Updated
379	M110A2 American 203mm Self-Propelled Howitzer (SPH)	USA	✓	
380	M107 American 175mm Self-Propelled Gun (SPG)	USA	✓	
381	MIM-23A Hawk American Surface-to-Air Missile (SAM) System	USA	✓	
382	MIM-23B I-Hawk American Surface-to-Air Missile (SAM) System	USA	✓	
383	M114 American 155mm Towed Howitzer	USA	✓	
384	BGM-71A TOW American Anti-Tank Guided Missile (ATGM)	USA	✓	
385	M113 American Armored Personnel Carrier (APC)	USA		✓
386	M113A1 American Armored Personnel Carrier (APC)	USA	✓	
387	M113A3 American Armored Personnel Carrier (APC)	USA	✓	
388	M113A2 American Armored Personnel Carrier (APC)	USA	✓	
389	AH-1W SuperCobra American Attack Helicopter	USA	✓	
390	AH-1J SeaCobra American Attack Helicopter	USA	✓	
391	AH-1F Cobra American Attack Helicopter	USA		✓
392	MD 500 Defender American Light Multi-Role Helicopter	USA	✓	
393	MD 530F Cayuse Warrior American Scout Attack Helicopter	USA	✓	
394	M113A2 American Amphibious Armored Personnel Carrier (APC)	USA		✓
395	AH-1W Super Cobra American Attack Helicopter	USA		✓
396	Arpia Venezuela Tactical Unmanned Aerial Vehicle (UAV)	Venezuela	✓	
397	Zastava M84 Yugoslavian 7.62mm General-Purpose Machine Gun	Yugoslavia	✓	

CORRECTION NOTICE

Correction: It has come to the attention of the TRADOC G-2 OE & Threat Analysis Directorate that a January 2017 Red Diamond Threats Newsletter article titled, "T-14 Gun-Missile Tank for the Russian Federation" by Jon H. Moilanen list the secondary weapon system of the T-14 Armata as a 7.62mm Machine Gun. In fact, the secondary armament of the T-14 Armata includes the Kord 12.7mm Heavy Machine Gun and the 7.62mm PKMT (Kalashnikov) General Purpose Machine Gun. Both machine guns are remotely-controlled and mounted on top of the unmanned turret.

The Red Diamond Threats Newsletter January, 2017 article, "T-14 Gun-Missile Tank for the Russian Federation" by Jon H. Moilanen can be located at the following website:

https://community.apan.org/wg/tradoc-g2/ace-threats-integration/m/documents/210978

The Worldwide Equipment Guide (WEG) "The T-4 Armata Main Battle Tank" profile can be viewed at the following website:

https://odin.tradoc.army.mil/WEG/Asset/T-14_Armata_Russian_Main_Battle_Tank

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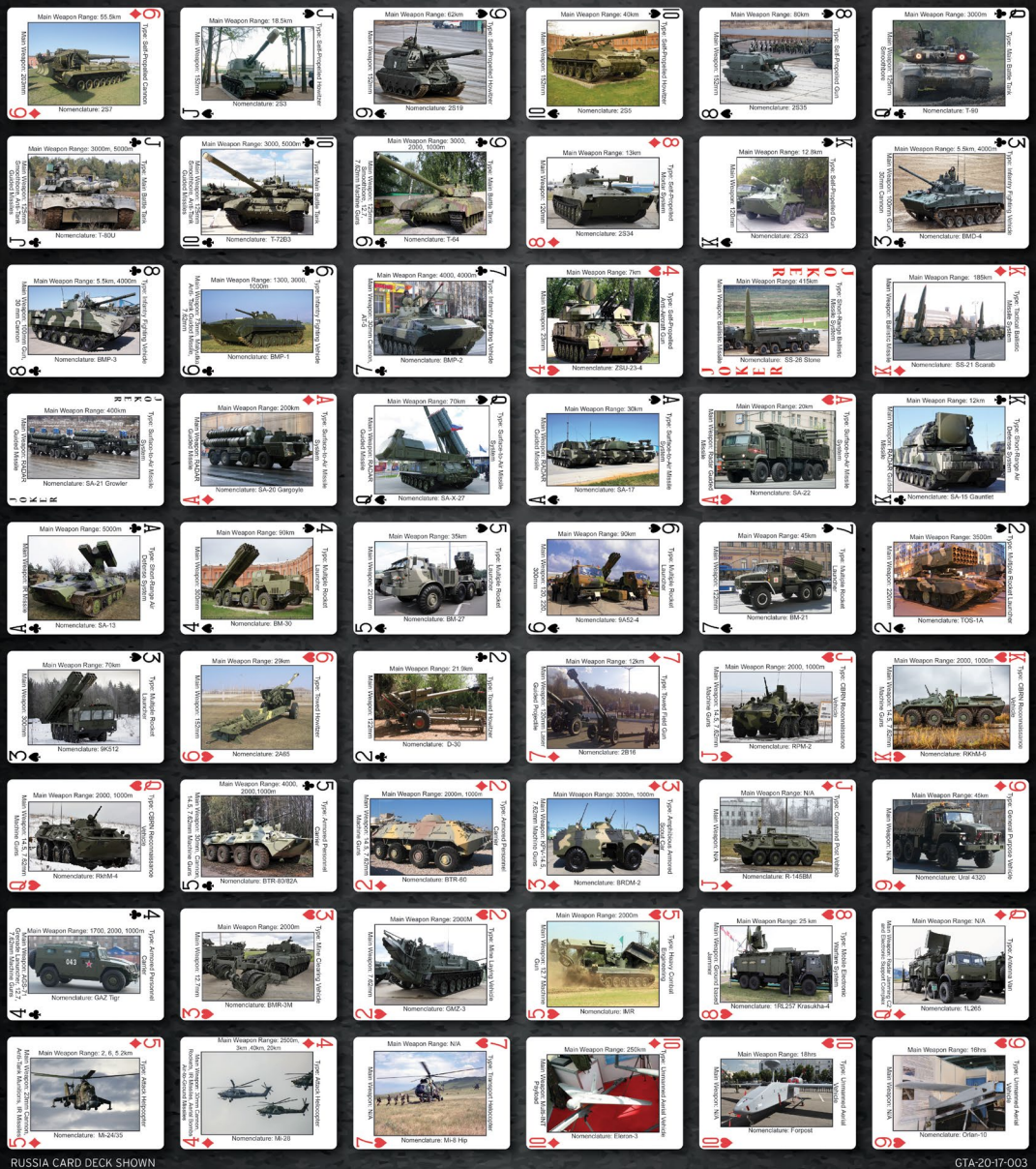

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1 August 2019